

**The Economic Costs of Drug and Alcohol Abuse in  
Washington State, 1996**

Prepared for:

Division of Alcohol and Substance Abuse,  
Department of Social and Health Services

By

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## **EXECUTIVE SUMMARY**

### **Background and Purpose**

Drug and alcohol abuse are major causes of widespread illness, disability, and premature death. The burden on society of these disorders encompasses the use of costly medical resources, significant losses of productivity, serious motor vehicle accidents, fire destruction, and criminal activity resulting in property destruction and incarceration. To quantify the economic costs of drug and alcohol abuse in Washington State, the Division of Alcohol and Substance Abuse within the Department of Social and Health Services sponsored a study conducted in 1993 (Wickizer et al. 1993). That study analyzed and documented the costs of substance abuse for 1990.

The current study, also sponsored by the Division of Alcohol and Substance Abuse, represents an update on the earlier study and documents the economic costs of substance abuse for Washington State for 1996. It follows the same general methodology as the earlier report and documents costs within seven areas: drug and alcohol treatment, morbidity, mortality, medical care, crime, other specific diseases, and other related costs.

### **Methodology**

This study builds directly on the previous Washington State economic cost study (Wickizer et al. 1993) and on two national studies, the first conducted by Rice et al. (1990), and the second conducted by Lewin Inc. under the sponsorship of the National Institute on Drug Abuse (NIDA) and the National Institute on Alcoholism and Alcohol Abuse (NIAAA) (NIDA/NIAAA 1998). This study, like the previous state and national studies, used a prevalence-based, cost-of-illness assessment methodology that relied on the human capital approach to value life and estimate

productivity losses. Studies using the human capital approach estimate direct and indirect costs of specific categories of illness. Direct costs are those for which payments are made (e.g., medical care or substance abuse treatment); indirect costs are those for which resources are lost (e.g., lost productivity due to morbidity).

A considerable amount of information was gathered for this study. Whenever possible, state data were used to derive the cost estimates. For some analyses, it was not possible to obtain state data. National data were then obtained and were extrapolated to Washington State. Cost estimates based on extrapolation should be interpreted somewhat cautiously, since they are generally less reliable.

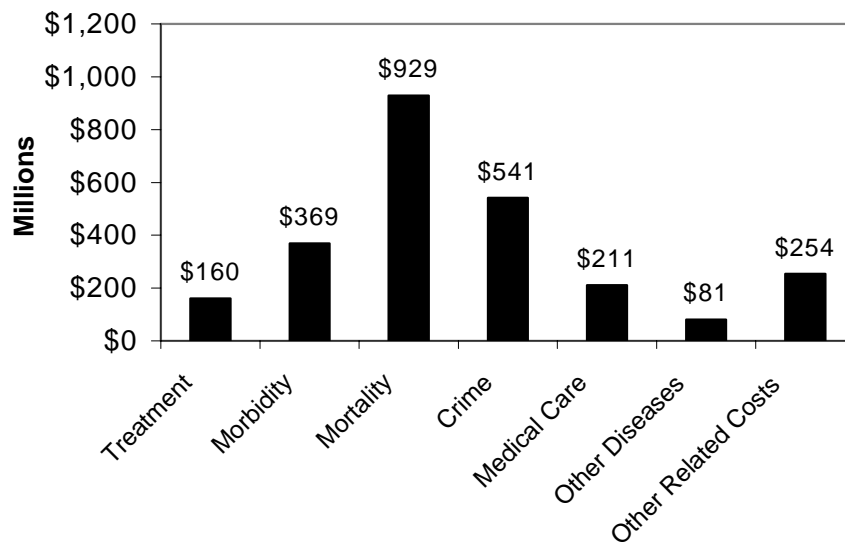
### **Findings**

Total economic costs of drug and alcohol abuse in Washington State in 1996 were estimated at \$2.54 billion. This represents a 39% increase over the 1990 cost estimate of \$1.81 billion. Approximately 20% of this increase was due to inflation, another 13% was due to population growth. Thus, the overall net increase, measured in inflation- and population-adjusted dollars, was on the order of 6%, or about 1% per year. On a per capita basis, the 1996 aggregate cost represents approximately \$531 per non-institutionalized person in the state.

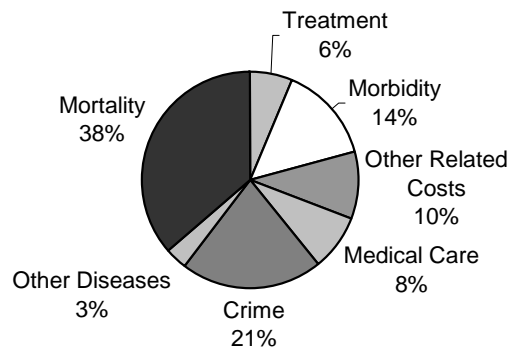
The magnitude and distribution of costs for 1996 among the areas analyzed are shown in Figures A and B below. As shown, premature mortality resulting from alcohol or drug abuse accounted for the largest cost, approximately \$929 million; followed by crime (\$541 million); morbidity (\$369 million); other related costs (\$254 million), consisting primarily of property damage from motor vehicle accidents; and medical care (\$211 million). In relative terms, as shown in Figure B, mortality accounted for 34% of total costs, while crime accounted for 20%.



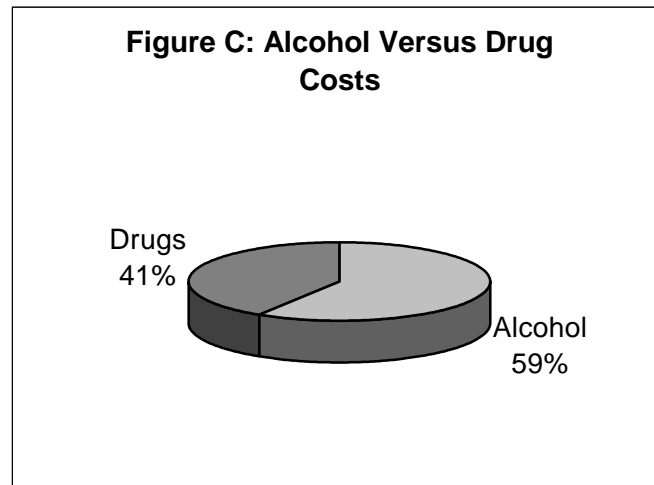
**Figure A: Economic Costs of Drug and Alcohol Abuse in Washington, 1996**



**Figure B: Distribution of Drug and Alcohol Costs**

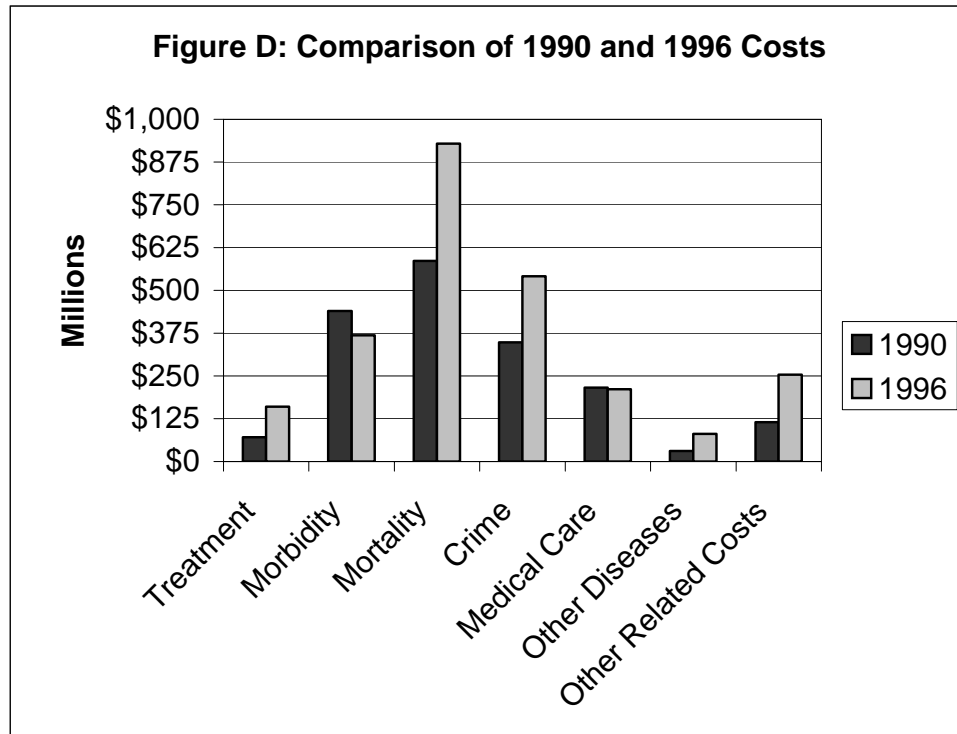


Drug and alcohol costs could be separated for five of the cost categories (all except treatment and other related costs). As shown in Figure C, for these five cost categories, alcohol accounted for 59% of total costs, drugs accounted for the remaining 41%.



A comparison of drug and alcohol costs for 1990 and 1996 is shown in Figure D. The cost categories with the largest expenditure increases were mortality, crime and other related costs. The decrease in morbidity costs is due to the different data sources used for the two sets of analyses. For 1996, the Washington State Substance Abuse Household Survey was used to estimate the prevalence of drug and alcohol abuse. The prevalence estimates generated by this survey were lower, but more reliable and accurate, than the previous estimates used for the earlier cost analysis (Wickizer et al. 1993).

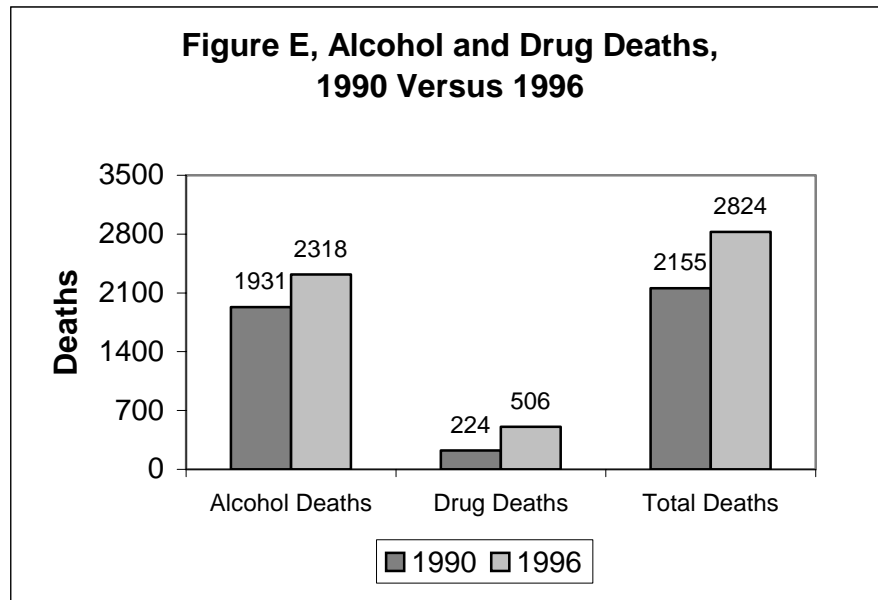
Even though there were substantially more drug- and alcohol-related hospital discharges in 1996 than 1990 (16,000 versus 10,500), Figure D shows little difference in total medical costs. A more conservative approach was used to estimate medical costs for 1996, which reduced the costs for hospitalized patients having a co-occurring (secondary) diagnosis of alcohol or drug dependence.



In addition to estimating economic losses arising from drug and alcohol abuse, the study generated other findings of interest. Some of the key findings were:

#### **Mortality:**

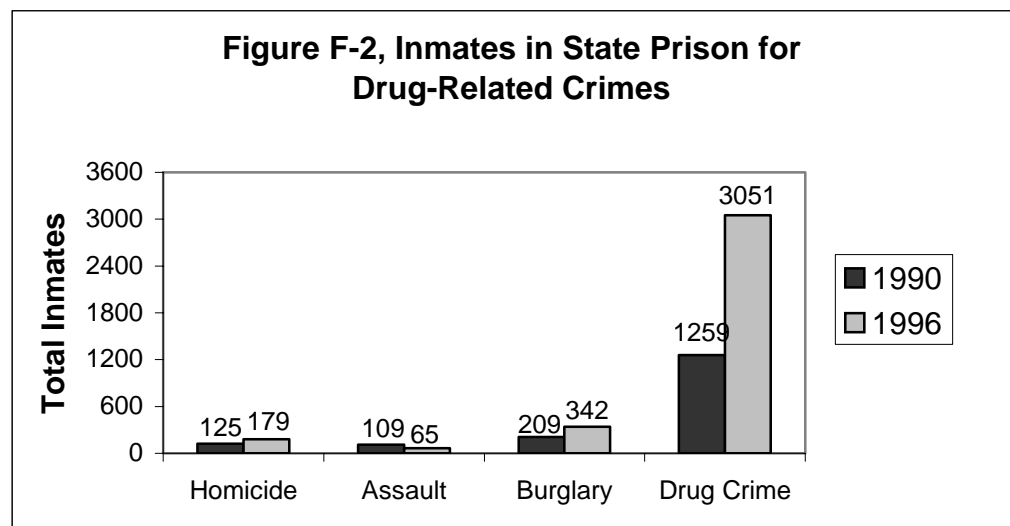
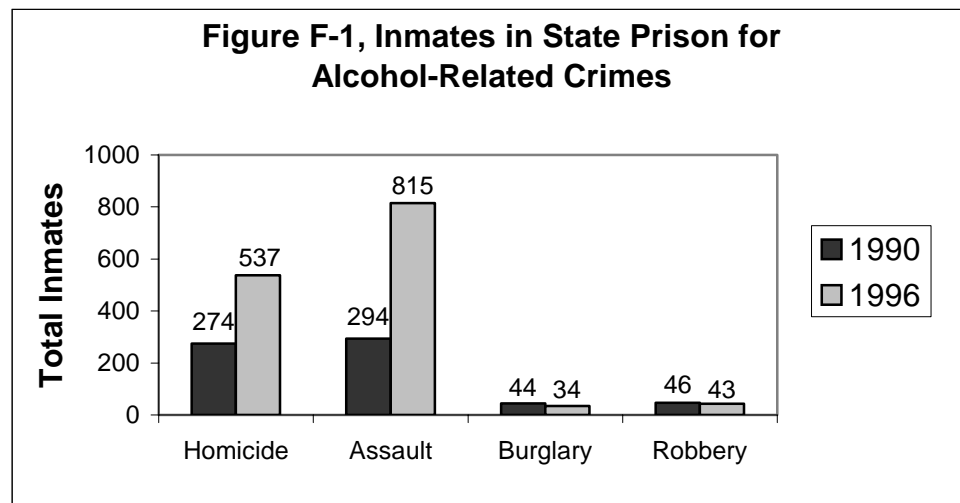
- 2,824 deaths occurred in Washington in 1996 caused by or related to drug and alcohol abuse. These deaths resulted in approximately 70,000 years of potential life lost. The leading causes of substance abuse-related deaths were:
  - motor vehicle accidents – 353 deaths
  - alcohol cirrhosis – 291 deaths
  - suicide – 223 deaths
- The estimated cost per death measured in terms of lost income was \$329,000.
- A comparison of drug- and alcohol-related mortality for 1990 and 1996 is shown in Figure E. Both alcohol- and drug-related deaths increased from 1990 to 1996, but the relative increase was much larger (126%) for drug-related deaths.



**Crime:**

- Of the 217 arrests for homicide, 65 were related to alcohol and 22 to drug abuse.
- Of the 6,003 arrests for felonious assaults, 1,801 were alcohol-related and 144 were drug-related.
- Of the 37,883 arrests for larceny-theft, 11,214 were drug-related and 1,061 were alcohol-related.
- 4,135 person years were served in state prisons or local jails as a result of criminal activity related to drugs. An additional 1,579 years were served as a result of criminal activity related to alcohol.

- A comparison of the number of inmates in state prison for selected drug- and alcohol-related crimes for 1990 and 1996 is shown in Figures F-1 and F-2. As shown in Figure F-1, the numbers of inmates incarcerated for alcohol-related homicides and assaults increased significantly, but the numbers of inmates for burglary and robbery remained unchanged. Figure F-2 shows a substantial increase in the numbers of inmates incarcerated for drug-related homicides and burglary, as well as drug crimes (possession and distribution).



**Medical Care:**

- There were approximately 16,000 hospital discharges classified as drug- or alcohol-related.
- The total cost of treating these hospital cases was \$130.8 million, of which \$108.7 million resulted from diseases and injuries classified as alcohol related.
- Injuries, alcohol dependence, acute pancreatitis, cerebrovascular disease, alcohol cirrhosis, and drug dependence represented the major disease categories in terms of hospital inpatient costs.

**Morbidity:**

- Of the \$368.7 million in economic costs related to morbidity, 82% resulted from alcohol abuse.
- Males aged 25-34 had the highest alcohol-related costs (\$56.2 million). The highest cost among females was for ages 35 to 44 (\$83.2 million).

**Summary and Implications**

Drug and alcohol abuse in Washington State result in significant economic losses. For 1996, the economic loss was estimated at \$2.54 billion, which represents a 39% increase over the \$1.81 billion estimated for 1990. However, population growth and inflation account for approximately 33% of this increase. Adjusting for these factors reduces the increase from 39% to approximately 6%. The largest losses in 1996 resulted from premature death and crime. Significant losses also resulted from morbidity and from property damage due to auto accidents, classified as “other related costs.”

The cost estimates for Washington State described above can be placed in context by comparing them with national cost estimates. From 1985 to 1992, drug and alcohol costs increased on a national basis, after adjusting for inflation and population growth, by 50% and 42%, respectively. This seven-year rate of growth

was much higher than Washington State's 6% growth over the period 1990 to 1996.

In 1995, national cost estimates for drug and alcohol abuse were, respectively, \$109.8 billion and \$166.5 billion. Washington State represents 1.91% of the nation's overall population. If its drug and alcohol costs were representative, one would expect them to equal roughly 1.91% of the national costs. Yet in 1996, Washington State's estimated costs (\$2.5 billion) were less than half the costs one would expect (\$5.3 billion) based upon the state's proportion of the U.S. population.

Whether, or the extent to which, these favorable economic cost outcomes result from treatment and prevention within Washington State is unclear. It is plausible that at least some of the difference in observed versus expected substance abuse costs results from Washington State's treatment and prevention efforts.

While the focus of this report is on the economic costs of substance abuse, one should not forget the other very real consequences of drug and alcohol abuse. In 1996, 2,824 persons died of causes related to drug and alcohol abuse, resulting in a combined loss of 70,000 years of potential life. Drunk driving affects thousands of persons in the state. In 1996, there were 263 fatalities in Washington involving alcohol-related automobile accidents, and almost 7,000 additional alcohol-related injury accidents. Approximately 3% to 5% of these injuries could be classified as severe or critical, and some may have led to lifelong disability.

One question raised by the cost estimates presented in this report is the following: Are we putting enough resources into preventing and treating the serious problem of drug and alcohol abuse? Washington State does devote significant resources to prevention and treatment, yet, as this report indicates, these resources are very limited in comparison to the economic burden imposed by substance abuse. According to a previous study (Kabel et al. 1996), only about 21% of persons

needing treatment meeting the income criteria for publicly funded treatment services actually receive care.

Washington State collects revenue through specially designated alcohol taxes and allocates a portion of this revenue to treatment, prevention and research. It is useful to compare the amount of revenue collected through alcohol taxes in relation to the cost of alcohol abuse. In fiscal year 1996, approximately \$136 million was gathered through state alcohol taxes levied on beer, wine and spirits. For every \$1 the state collected in tax revenue from alcohol sales in 1996, \$12 was spent as a result of alcohol abuse.

The economic costs of substance abuse in Washington are increasing, but at a slower rate than for the nation as a whole. Yet the large magnitude of these costs--\$2.54 billion in 1996 and the gap between treatment need and access (only 21% of those in need of publicly funded treatment actually receive treatment)--suggests a continued necessity to consider whether current resources for treatment and prevention are adequate.



# **Chapter 1**

## **Introduction**

### **Introduction and Background**

The problem of alcohol and drug abuse continues to be a major social concern, with serious personal, social and economic consequences for the nation as a whole as well as Washington State. Alcohol and drug abuse are major causes of widespread illness, disability, and premature death. The burden on society of these disorders encompasses the use of costly health care resources, significant productivity (economic) losses due to morbidity, serious injuries from motor vehicle accidents, and criminal activity resulting in property damage and incarceration.

It is not possible to quantify in monetary terms all of the consequences of drug and alcohol abuse, but some of the economic losses can be estimated. There are two important reasons for analyzing the economic costs of alcohol and drug abuse: (1) public and private resources are allocated for prevention and treatment, and it is important to know how this investment compares with the economic costs of substance abuse; and (2) it is useful to track changes in economic costs over time to determine how they are changing.

This report analyzes the economic costs of alcohol and drug abuse for Washington State for 1996 and updates an earlier study (Wickizer et al 1993), which analyzed costs for 1990. Both studies were sponsored by the Division of Alcohol and Substance Abuse (DASA), within the Department of Social and Health Services. Similar efforts to analyze the economic costs of substance abuse have been undertaken by other states, including Texas, Minnesota, and Oregon, as well as by the federal government. Because the methodologies, time periods, and data sources for these studies differ, comparing their results is difficult. However, the two national studies, sponsored by the National Institute of Drug Abuse (NIDA) and the National Institute of Alcoholism and Alcohol Abuse

(NIAAA) do provide the basis for a limited comparison of costs (Rice et al. 1990; NIDA/NIAAA 1998).

## **Methodology**

This study builds directly on the earlier Washington State cost analysis (Wickizer et al. 1993) as well as on the two national studies. All of these studies used the same general approach, employing prevalence-based data and the human capital method to estimate costs. Prevalence-based costs provide an estimate of the direct and indirect economic burden incurred in a time period (the base period) resulting from the prevalence of a disease (e.g., substance abuse). For the earlier report, the base period was 1990. For this report, the base period is 1996.

Prevalence-based costs measure the value of resources used or lost during a specified period of time, regardless of the time of disease onset. In estimating the economic burden resulting from the prevalence of disease, the present discounted value of future losses due to mortality are calculated.

Cost-of-illness studies, like this one, require the valuation of human life. Two approaches can be used to value life, the human capital and willingness-to-pay approach. This study, and all previous economic cost studies, used the human capital approach, which measures an individual's value to society in terms of his or her production potential, reflected in earnings. From this perspective, the value of an individual to society is his or her earnings, and the value of a lost life due to premature death becomes the discounted stream of future earnings of that individual.

Studies employing the human capital approach measure the direct and indirect costs of specific disease categories. Direct costs are those for which payments are made (e.g., medical care or alcohol treatment), indirect costs are those for which resources are lost (e.g., lost productivity due to morbidity or mortality). The estimation of direct costs is straightforward, but indirect costs are more difficult to analyze because they require valuation of a person's production potential. The human capital approach is based on the restrictive assumption that a person's

earnings reflect his or her value. Obviously, this undervalues certain members of society: children, elderly, ethnic minorities and women. Despite its limitations, the human capital approach remains widely used and provides a useful method for analyzing the cost of disease.

### **Limitations of Current Study**

This analysis has two limitations that merit mention. First, to estimate costs related to drug and alcohol abuse, the analysis had to link different “cost factors” to alcohol and drug abuse. This was done in the usual manner by applying “attributable fractions” to these cost factors. For example, if 30% of all stomach cancer is associated with alcohol abuse, then 30% of all medical costs incurred in treating stomach cancer should be attributed to alcohol abuse. The attributable fractions used here are the same as those used for the recent national cost analysis (NIDA/NIAAA 1998). While these are based on the best available information, many of the attributable fractions were developed from research conducted as much as 20 years ago. Second, though an effort was made to obtain data from Washington State, this was not always possible. In this case, national data were obtained and were extrapolated to Washington State. In general, estimates based upon extrapolated data are less reliable.

### **Organization of the Report**

The report is organized into nine chapters. Chapters two through eight present cost estimates for each of the seven cost areas analyzed: alcohol and drug treatment, morbidity, mortality, crime, medical care, other related diseases, and other related costs. The final chapter summarizes the findings of the analysis and outlines some policy implications. This report does not include as much technical discussion of the cost estimation procedures as the earlier cost report (Wickizer et al. 1993). Readers interested in a more detailed discussion of the methods used to estimate morbidity, mortality and medical care costs should review the appendices included in the earlier report (Wickizer et al. 1993).

## **Chapter 2 Treatment**

Treatment services available in Washington to help persons with chemical dependency problems include various levels of residential programs, outpatient programs, methadone maintenance, detoxification, and specialty programs for youth, pregnant women, mentally ill/chemically addicted, and Spanish-speaking persons.

This chapter documents treatment costs in Washington for 1996 and also presents information concerning service utilization. Complete and detailed information regarding treatment costs is difficult to obtain because of the multiplicity of funding sources and the large number of programs. The best source of current information on treatment costs is the Uniform Facility Data Set (UFDS) maintained by the Office of Applied Studies at the Substance Abuse and Mental Health Services Administration (SAMHSA). The cost and service utilization data presented in this chapter are based on the 1996 UFDS survey.

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### **The major findings of the analysis were:**

- The total estimated cost of providing treatment in Washington State in 1996, based on reported annual revenue, was \$160 million.
  - Of this amount, 21.7% came from client payments, 18.5% from private insurance, 9.1% from Medicaid, 2.1% from Medicare, 19.2% from state funds (including Block Grants), 22.9% from other federal government funds, 5.0% from local or other public funds, and 1.5% unknown funding source.
  - Approximately 35,500 clients were reported in treatment on October 1, 1996.
-

## **Methodology**

Cost estimates and treatment service information reported in this chapter are based upon the 1996 Uniform Facility Data Set (UFDS) survey, administered by SAMHSA. This survey is the only ongoing national survey of all public and private treatment facilities. The UFDS replaced the National Drug and Alcoholism Treatment Unit Survey (NDATUS). Cost data gathered through the UFDS survey represents total annual revenue, while the utilization information represents a one-day (October 1, 1996) client census. The UFDS, and its forerunner NDATUS, gathered client utilization data for one day in order to ease the reporting burden on programs and thereby increase the response rate. A total of 295 treatment programs in Washington participated in the 1996 UFDS survey, representing an 85% response rate, similar to the nation as a whole. Despite its limitations, the UFDS survey is the single best, most complete, source of treatment information available.

## **Results**

Major sources of treatment funding are shown in Table 2.1. The data presented in the table provide conservative cost estimates because they include only treatment programs reporting complete funding information through the UFDS survey. Ten percent of the treatment programs in Washington did not provide funding information.

Treatment costs totaled approximately \$160 million. The single largest payer source was federal government funds (not including Medicare or Medicaid), which accounted for 22.9% of all treatment funding. The second most important source was client payments (21.7%), followed by state funding (19.2%) and private health insurance (18.5%). None of the other funding sources shown accounted for more than 10% of total funding.

**Table 2.1**  
**Treatment Funding by Payer, Washington, 1996**

<b>Funding Source</b>	<b>Funding (\$)</b>	<b>Percentage (%)</b>
<b>Public Funding</b>		
State Funding (including federal block grants)	30,700,000	19.2
Medicaid	14,560,000	9.1
Medicare	3,360,000	2.1
Other federal gov't funds	36,640,000	22.9
Local gov't funds	6,240,000	3.9
Other public funds	1,760,000	1.1
<b>Private Funding</b>		
Client payments	34,720,000	21.7
Private health insurance	29,600,000	18.5
Other/unknown funds	2,400,000	1.5
<b>Total</b>	<b>\$159,998,000</b>	<b>100.0%</b>

Treatment costs reported in the earlier 1990 report were \$71 million. Adjusting for inflation would increase this amount to approximately \$85 million, roughly half of what was reported for 1996. But this comparison should be made cautiously, since the data sources for the two years differ. The method of administering the survey and conducting follow up on non-respondents changed in 1993. These changes likely increased the reliability of the 1996 data.

Data gathered through UFDS includes limited information about treatment services, utilization and program capacity. The survey data indicate that approximately 92% of the clients in treatment on October 1, 1996 received outpatient services (Table 2.2). Sixteen percent of the clients received treatment for drug problems only, 37% for alcohol problems only, and the remaining 47% received treatment for dual abuse problems.

**Table 2.2**  
**Number of Clients Treated by Type of Disorder,**  
**Washington, 1996**

Type of Disorder	Treatment Type		Total	Percentage (%)
	Inpatient	Outpatient		
Drug abuse	449	5,260	5,709	16.0
Alcohol abuse	902	12,302	13,204	37.2
Dual abuse	1,589	15,012	16,601	46.8
<b>Total</b>	<b>2,940</b>	<b>32,574</b>	<b>35,514</b>	<b>100%</b>

As shown in Table 2.3, 79% of the clients in treatment were white, 8% were black, 4% were Hispanic, 4% were Native American, and the remaining small portion included Asian, other groups or were unknown. The demographic profile of the state population overall is shown in the last column of Table 2.3. In general, the treatment population reflects the state population, except Blacks and Native Americans are somewhat overrepresented in the treatment population, while whites and Asians are underrepresented.

**Table 2.3**  
**Number of Clients Treated by Ethnic Group,**  
**Washington, 1996**

Ethnic Group	Inpatient	Outpatient	Total	Treatment Population (%)	State Population Overall (%)
White	2,208	25,864	28,072	79.0	86.8
Black	382	2,313	2,695	7.6	3.0
Hispanic	97	1,368	1,465	4.1	4.4
Asian	26	293	319	0.9	4.2
Native American	179	1,205	1,384	3.9	1.6
Other	3	131	134	0.4	--
Unknown	47	1,400	1,447	4.1	--
<b>Total</b>	<b>2,940</b>	<b>32,574</b>	<b>35,514</b>	<b>100%</b>	<b>100%</b>

Approximately 5% of the clients treated were under 18, 27% were 18-24, 28% were 25-34, 22% were 35-44 and the remaining portion were either over 45 or were unknown (Table 2.4). There was little variation in the proportion of clients treated by modality. However, younger clients under 18 tended to receive inpatient treatment more frequently. The age profile of clients in Washington was similar to the nation overall.

**Table 2.4**  
**Number of Clients Treated by Age, Washington, 1996**

<b>Age Group</b>	<b>Inpatient</b>	<b>Outpatient</b>	<b>Total</b>	<b>Percentage (%)</b>
Under 18	235	1,433	1,668	4.8
18-24	488	9,186	9,674	27.2
25-34	974	9,023	9,997	28.2
35-44	759	6,938	7,697	21.6
45-54	273	2,769	3,042	8.5
55-64	91	913	1,004	2.8
65+	79	423	502	1.5
Unknown	41	1,889	1,930	5.4
<b>Total</b>	<b>2,940</b>	<b>32,574</b>	<b>35,514</b>	<b>100</b>

## Summary

Treatment costs in Washington State in 1996 were estimated at \$160 million, representing a per capita expenditure of approximately \$33. The largest funding categories were federal, not including Medicare or Medicaid, (22.7%); client payments (21.7%); state funds (19.2%); and private health insurance (18.5%). In contrast, Washington State spent \$85 million (inflation adjusted dollars) for treatment in 1990. The change in treatment costs from 1990 to 1996 reflected significant increases in both public and private funding.



Despite expenditures of \$160 million, Washington State still only provides treatment for 21% of persons below 200% of the federal poverty limit in need of treatment (Kabel et al. 1996). Further, the amount of resources devoted to treatment (\$160 million) represents a modest investment (6%) in relation to the total cost of substance abuse in Washington State (\$2.54 billion). Increasing this investment may yield future benefits in the form of decreased economic costs, but this question goes well beyond the current analysis. The degree of unmet need for treatment when viewed in light of the economic cost of substance abuse raises compelling questions about the adequacy of Washington State's investment in treatment services.

## Chapter 3

### Morbidity

Alcohol and drug use or dependence may adversely affect an individual's work productivity as well as his or her ability to function in other roles. Examples of reduced work productivity would include a worker feeling hung-over from heavy drinking the night before, using drugs or alcohol on the job, or leaving work early to use drugs or consume alcohol. An individual's productivity in other non-work roles may also be affected by alcohol or drug use, e.g., performing household or child care duties. In all these cases, reduced output resulting from alcohol or drug use can be measured as an economic loss. It is often assumed, incorrectly, that the affected worker or individual incurs all of the costs for his or her behavior. But alcohol and drug abuse or dependence create an economic loss borne by society at large.

This chapter analyzes morbidity costs for Washington for 1996. It follows the same general methodology as used for the previous Washington State economic cost report (Wickizer et al. 1993). Interested readers can obtain more detailed information on the methods used to derive morbidity cost estimates from Appendix A of the earlier cost report (Wickizer et al. 1993).

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**The major findings of the analysis were:**

- Total morbidity costs in 1996 were \$368.7 million.
  - Approximately 82% of the morbidity costs were attributable to alcohol use.
  - Males accounted for 63% of total costs.
  - Morbidity costs represent approximately 40% of mortality costs.
  - Total morbidity costs in 1996 were 20% less than in 1990 (\$439.5 million).  
This difference resulted from more conservative alcohol and drug abuse prevalence figures used for the current report.
-

## **Methodology**

Morbidity costs represent reduced productivity from alcohol and drug abuse, measured in terms of either wage earnings for workers or housekeeping value for non-workers. The method used to estimate morbidity costs was the same as used for the earlier Washington State cost report (Wickizer et al. 1993), with one important difference. This report relied on substance use disorder (18-month) prevalence estimates provided by the 1993 Washington State Substance Abuse Household Survey, sponsored by the Division of Alcohol and Substance Abuse. These estimates were based, in part, upon DSM-III criteria for alcohol and drug dependence. More formally, the substance use disorder prevalence estimates were based upon the following three criteria (Kabel et al. 1996): (1) diagnosis of lifetime dependence or abuse; (2) use of a substance in the last 18 months; and (3) experienced a DSM-III-R abuse or dependence symptom in the last 18 months.

Alcohol abuse prevalence estimates for the earlier cost report (Wickizer et al. 1993) were based upon the behavioral risk factor survey (BRFS); drug abuse prevalence estimates were extrapolated based on the Epidemiology Catchment Surveys. These two data sources defined drug and alcohol abuse more broadly than the criteria noted above, and thus produced higher prevalence estimates. These higher prevalence figures resulted in higher morbidity cost estimates.

Estimating morbidity costs involved several steps. First, the numbers of persons with a drug or alcohol use disorder were estimated based upon prevalence data gathered through the Substance Abuse Household Survey. Second, the numbers of persons with a drug or alcohol use disorder within age-sex groups were multiplied by the labor force participation rate within each group to calculate the numbers of employed persons with a substance use disorder. But even if an individual does not work, substance abuse may result in some economic loss through reduced ability to perform other activities, such as maintaining a household. Therefore, the numbers of unemployed persons with a substance

use disorder were also determined by taking 100% minus the labor force participation rate. Third, average earnings for each age-sex group were calculated and then multiplied by the relevant impairment rate to generate estimates of lost earnings due to drug and alcohol abuse. This procedure was repeated using data for housekeeping values to generate economic loss estimates for unemployed persons. Finally, the average loss per person with a substance use disorder was multiplied by the number of such persons to derive estimates of total morbidity costs.

## **Results**

Approximately 268,000 individuals in Washington State had an alcohol use disorder in 1996, an additional 65,000 persons had a drug use disorder (Table 3.1). Based on the substance use disorder criteria discussed on the previous page, the prevalence rate for alcohol use disorder varied from 30% for males 18-24 to less than 1% for older females over 55. The prevalence of drug use disorder was highest (7.6%) among young males aged 18-24.

Based upon labor force participation rates, as shown in Table 3.2 below, there were approximately 216,000 employed persons with an alcohol use disorder and 54,000 additional employed persons with a drug use disorder. Thus, within Washington State's labor force, there were over *one quarter of a million* persons with serious substance abuse problems working in 1996. There were an estimated 52,000 additional persons not in the labor force who could be considered to have an alcohol use disorder based on DSM-III criteria and 12,000 additional persons with a drug use disorder.

**Table 3.1**  
**Population, Prevalence, and Abusers by Age and Sex, 1996**

<b>Male</b>	<b>Population [1]</b>	<b>Alcohol Use Disorder Prevalence [2] %</b>	<b>Drug Use Disorder Prevalence [2] %</b>	<b>Persons with Alcohol Use Disorder [1*2]</b>	<b>Persons with Drug Use Disorder [1*2]</b>
18-24	240,492	30.0	7.6	72,148	18,277
25-34	411,877	14.4	1.2	59,310	4,942
35-44	468,846	3.5	2.8	16,409	13,127
45-54	346,663	2.7	0.4	9,360	1,387
55-64	201,456	6.2	0.1	12,490	201
65+	262,584	2.6	0.1	6,827	262
<b>Total</b>	<b>1,931,918</b>			<b>176,544</b>	<b>38,196</b>

<b>Female</b>	<b>Population [1]</b>	<b>Alcohol Use Disorder Prevalence [2] %</b>	<b>Drug Use Disorder Prevalence [2] %</b>	<b>Persons with Alcohol Use Disorder [1*2]</b>	<b>Persons with Drug Use Disorder [1*2]</b>
18-24	225,332	15.6	6.4	35,152	14,421
25-34	400,125	5.5	1.5	22,007	6,002
35-44	461,703	5.4	1.4	24,932	6,464
45-54	345,447	1.9	0.02	6,563	69
55-64	205,334	0.04	0.001	83	2
65+	358,399	0.8	0.001	2,867	4
<b>Total</b>	<b>1,996,340</b>			<b>91,604</b>	<b>26,962</b>

Sources:

[1] Population: 1996 population estimates, Washington Department of Health.

[2] Alcohol and drug prevalence: Washington State Substance Abuse Household Survey, Division of Alcohol and Substance Abuse, 1993 (Kabel et al. 1996). See page 12 for a discussion of the criteria and definition of substance use disorder.

**Table 3.2**  
**Labor Force Participation Rates, Employed and Unemployed**  
**Abusers by Age and Sex, 1996**

<b>Male</b>	<b>Labor Force Participation Rates</b>	<b>Employed Persons with Alcohol Use Disorder</b>	<b>Employed Persons with Drug Use Disorder</b>	<b>Unemployed Persons with Alcohol Use Disorder</b>	<b>Unemployed Persons with Drug Use Disorder</b>
	<b>[1] %</b>	<b>[2]</b>	<b>[3]</b>	<b>[4]</b>	<b>[5]</b>
18-24	79.6	57,430	14,548	14,718	3,729
25-34	97.2	57,649	4,804	1,661	138
35-44	97.5	15,999	12,799	410	328
45-54	93.2	8,724	1,293	636	94
55-64	69.1	8,631	139	3,859	62
65+	16.8	1,147	44	5,680	218
<b>Total</b>		<b>149,580</b>	<b>33,627</b>	<b>26,964</b>	<b>4,569</b>

<b>Female</b>	<b>Labor Force Participation Rates</b>	<b>Employed Persons with Alcohol Use Disorder</b>	<b>Employed Persons with Drug Use Disorder</b>	<b>Unemployed Persons with Alcohol Use Disorder</b>	<b>Unemployed Persons with Drug Use Disorder</b>
	<b>[1] %</b>	<b>[2]</b>	<b>[3]</b>	<b>[4]</b>	<b>[5]</b>
18-24	70.4	24,747	10,152	10,405	4,269
25-34	76.7	16,879	4,604	5,128	1,398
35-44	79.4	19,796	5,132	5,136	1,332
45-54	72.6	4,765	50	1,798	19
55-64	45.7	38	1	45	1
65+	8.0	229	0	2,638	4
<b>Total</b>		<b>66,454</b>	<b>19,939</b>	<b>25,150</b>	<b>7,023</b>

Sources:

[1] Labor Force Participation Rate (1996) Washington Labor Market and Economic Analysis.

[2,3] Produced by multiplying the alcohol and drug disorder populations by the labor force participation rates.

[4,5] Produced by multiplying the alcohol and drug disorder populations by 100% - the labor force participation rates.

Average annual male wages in Washington State in 1996 ranged from an estimated \$11,762 for persons aged 18-24 to \$42,990 for persons aged 45-54 (Table 3.3). The corresponding earnings for females were less. Housekeeping values, which represent imputed market values for maintaining the home, are included in Table 3.3. Employment earnings do not capture all of the productive capacity of individuals, because people have to maintain households apart from

their jobs. Thus, Table 3.3 includes two sets of housekeeping values, one for persons in the labor force, the second for persons not in the labor force. Housekeeping values are significantly higher for females than males, reflecting the relative amount of time spent in this activity.

**Table 3.3**  
**Earnings, Housekeeping Rates, and Impairment Rates**  
**by Age and Sex, 1996**

<b>Male</b>	<b>Average Earnings [1]</b>	<b>Housekeeping (\$) [2]</b>	<b>Housekeeping Not in the Labor Force (\$) [3]</b>	<b>Impairment Rates</b>	
				<b>Alcohol [4] %</b>	<b>Drugs [4] %</b>
18-24	\$11,762	\$3,226	\$6,684	1.4	1.1
25-34	\$28,391	\$3,889	\$7,398	3.0	2.6
35-44	\$39,989	\$4,225	\$7,757	5.5	8.3
45-54	\$42,990	\$4,246	\$7,776	5.5	8.3
55-64	\$37,159	\$4,540	\$8,070	9.3	7.3
65+	\$421,395	\$3,278	\$6,229	9.3	7.3

<b>Female</b>	<b>Average Earnings [1]</b>	<b>Housekeeping (\$) [2]</b>	<b>Housekeeping Not in the Labor Force [3]</b>	<b>Impairment Rates</b>	
				<b>Alcohol [4] %</b>	<b>Drugs [4] %</b>
18-24	\$10,338	\$10,050	\$16,639	0.8	0.2
25-34	\$14,908	\$11,614	\$18,127	2.8	1.1
35-44	418,215	\$12,211	\$18,798	11.9	1.8
45-54	\$19,620	\$10,608	\$17,197	11.9	1.8
55-64	\$21,296	\$10,422	\$17,086	18.7	7.3
65+	\$9,354	\$4,991	\$8,182	18.7	7.3

Sources:

[1] Earnings: Bureau of the Census (1991) 1990 Money Incomes of Households, Families and Persons in the US (inflation adjusted to reflect 1996 prices).

[2,3] Housekeeping Values: Rice et al. (1990)

[4] Impairment Rates: Rice et al. (1990)

Table 3.3 includes impairment rates for different age-sex groups for alcohol and drugs. These impairment rates provide an estimate of reduced productivity, measured by earnings, associated with drug and alcohol use disorder. For example, for males aged 55-64 the alcohol impairment rate is 9.3%, indicating

that males in this age group are, on average, 9.3% less productive as a result of alcohol use disorder. The impairment rates shown in Table 3.3 were the same as those used for the earlier cost report (Wickizer et al. 1993).

The data presented in Tables 3.1 - 3.3 were used to derive morbidity cost estimates shown below in Table 3.4. Total morbidity costs for Washington State in 1996 were estimated at \$368.7 million. Males accounted for 63% (\$233.6 million) of these costs, females accounted for the remaining 37% (\$135 million). Alcohol abuse was responsible for over 80% of the total morbidity costs, or \$303.5 million out of \$368.7 million. The higher costs associated with alcohol abuse is primarily a function of its higher prevalence rates, and to a lesser extent differences in impairment rates (Tables 3.1 and 3.3).

**Table 3.4**  
**Total Morbidity Costs by Age and Sex, 1996**

<b>Male</b>	<b>Alcohol [1]</b>	<b>Drugs [2]</b>	<b>Total</b>
18-24	\$13,443,792	\$2,661,818	\$16,105,610
25-34	\$56,230,623	\$4,057,052	\$60,287,675
35-44	\$39,068,639	\$47,183,562	\$86,252,201
45-54	\$22,937,160	\$5,129,190	\$28,066,350
55-64	\$36,369,127	\$459,634	\$36,828,761
65+	\$5,921,085	\$178,434	\$6,099,519
Subtotal	\$173,970,426	\$59,669,690	\$233,640,116
<b>Female</b>	<b>Alcohol [1]</b>	<b>Drugs [2]</b>	<b>Total</b>
18-24	\$5,417,626	\$557,109	\$5,974,735
25-34	\$15,129,242	\$1,622,570	\$16,751,812
35-44	\$83,170,548	\$3,262,552	\$86,433,100
45-54	\$20,818,413	\$33,090	\$20,851,503
55-64	\$369,153	\$3,563	\$372,716
65+	\$4,650,318	\$2,388	\$44,652,706
Subtotal	\$129,555,300	\$5,481,272	\$135,036,572
<b>Total</b>	<b>\$303,525,726</b>	<b>\$65,150,962</b>	<b>\$368,676,688</b>

[1,2] Calculated by multiplying the average loss per person with a substance use disorder by the population of such persons for each age and sex group.



## **Summary**

The findings of the analysis presented in this chapter indicate that alcohol and drug abuse in Washington result in substantial economic loss through reduced productivity. Total morbidity costs for 1996 were estimated at \$368.7 million. Over 80% of these costs resulted from alcohol abuse. The age-sex group with the highest morbidity cost was females aged 35-44 (\$83.2 million). A relatively high prevalence rate for alcohol abuse, coupled with a relatively high impairment rate and housekeeping value, accounted for this figure.

The 1996 morbidity cost estimates are lower than 1990 cost estimates (\$439.6 million) presented in the earlier cost report (Wickizer et al. 1993). But the two sets of cost estimates are not strictly comparable because, as discussed earlier, they were derived from different data sources. Whether morbidity costs actually increased or decreased between 1990 and 1996 cannot be determined, but the 1996 cost estimates do provide a more accurate and reliable picture of the true economic loss sustained from drug- and alcohol-related morbidity.

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## Chapter 4

### Mortality

Premature death due to drug and alcohol use and abuse imposes a major economic loss on society. Premature death through illness or injury can occur through auto accidents involving alcohol, through increasing the risk of cancer or cerebrovascular disease, or through violence involving drugs or alcohol. When an individual dies prematurely, there is an economic cost to society in the form of loss of that individual's productive capacity.

This chapter analyzes mortality costs for Washington for 1996. It has three aims:

1. To determine the number of alcohol- and drug-related deaths.
2. To estimate the number of years of potential life lost from these deaths.
3. To estimate the total economic costs of drug- and alcohol-related deaths.

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#### **The major findings of the analysis were:**

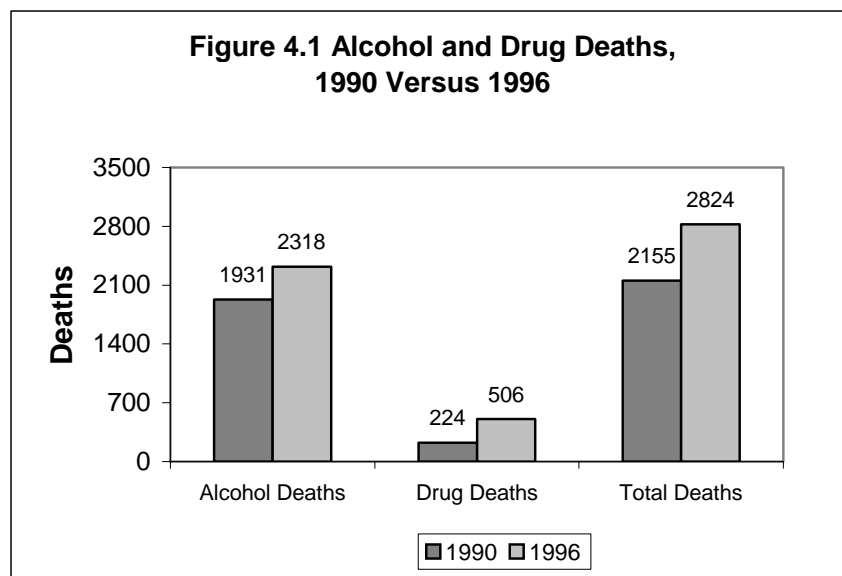
- 2,824 deaths related to drug and alcohol abuse occurred in 1996, including 2,318 alcohol- and 506 drug-related deaths. In contrast, in 1990 2,155 drug- and alcohol-related deaths occurred.
  - These 2,824 deaths resulted in 70,163 years of potential life lost.
  - Major causes of death were:
    - motor vehicle accidents—353 deaths
    - alcoholic cirrhosis—291 deaths
    - suicide—223 deaths
  - Total mortality costs for 1996 were \$929 million, as compared to \$586 million for 1990. Of the \$929 million, \$651 million resulted from alcohol abuse and \$278 from drug abuse.
  - The average cost per death in 1996, measured in lost earnings, was \$329,000.
-

## Methodology

The same methodology used to estimate mortality costs for the earlier cost report (Wickizer et al. 1993) was used for this report. Interested readers can consult the earlier report (see Appendix B) for methodological details. In brief, four steps were followed. First, death records provided by the Washington State Health Department were examined to determine the number of people dying from alcohol- and drug-related causes. Second, the number of years of potential life lost was calculated for each death, based on vital statistics data regarding life expectancy. Third, the lifetime earnings for age-sex cohorts were determined. Fourth, the number of alcohol- and drug-related deaths for each age-sex cohort was multiplied by the lifetime earnings to derive estimates of mortality costs.

## Results

There were 2,824 deaths in Washington in 1996 caused by or related to drug or alcohol use. As documented in the earlier cost report (Wickizer et al. 1993), 2,155 deaths occurred in 1990. Figure 4.1 shows the number of drug- and alcohol-related deaths for 1990 and 1996



On a relative basis, the number of deaths increased by 31%. Thirteen percent of this increase was due to population growth. A breakdown of the deaths by age and sex is shown in Table 4.1 below. Alcohol accounted for 70% of all deaths, and persons over 65 represented the greatest proportion of these deaths. In contrast, younger persons aged 25-44 accounted for the greatest proportion of drug-related deaths.

More detailed information concerning alcohol- and drug-related deaths is presented in Tables 4.2 and 4.3, which show how the mortality estimates were derived. Table 4.2 includes a column labeled alcohol attributable fraction (AAF), which represents the percentage of deaths within a given diagnosis believed to be attributable to alcohol. For example, the AAF for acute alcoholic hepatitis is 1 indicating 100% of deaths in this category were due to alcohol. The AAF for cancer of the larynx is .5 indicating 50% of the deaths from this form of cancer could reasonably be associated with alcohol use. Table 4.3 has a column labeled drug attributable fraction (DAF) which provides corresponding information for drug-related deaths. Multiplying the total number of deaths within a diagnostic category by the AAF or DAF gives an estimate of the number of deaths attributable to drug or alcohol use. The AAF and DAF values used for this report are the same as those used for the national cost studies (Rice et al. 1990; NIDA/NIAAA 1998). These values are based on research reported by Ravenholt (1984) and Roizen (1985).

Table 4.1  
**Alcohol- and Drug-Related Deaths by Age and Sex**

Age	Alcohol Related Deaths				Drug Related Deaths			
	Female		Male		Female		Male	
	No.	%	No.	%	No.	%	No.	%
1-18	31	4.6	57	4.6	2	1.5	6	1.6
19-24	19	2.3	90	6.0	6	4.4	25	6.7
25-34	44	5.4	139	9.4	19	14.1	82	22.1
34-44	81	9.7	194	12.8	57	42.2	160	43.1
45-54	88	10.6	223	14.7	24	17.8	63	17.0
55-64	79	9.5	204	13.6	6	4.4	9	2.4
65+	480	57.9	589	38.9	21	15.6	26	7.1
<b>Total</b>	<b>821</b>	<b>100.0</b>	<b>1497</b>	<b>100.0</b>	<b>135</b>	<b>100.0</b>	<b>371</b>	<b>100.0</b>

As shown in Table 4.2, motor vehicle accidents accounted for the greatest number of alcohol-related deaths (353), followed by alcoholic cardiomyopathy (291), cerebrovascular disease (252), and suicide (223). For drugs (Table 4.3), accidental poisoning was the leading cause of death (303 deaths). This same general pattern was observed in the earlier report.

Table 4.4 provides detailed information on the number of years of potential life lost (YPLL) due to drug and alcohol use and the estimated economic cost of premature death. The increased number of deaths in 1996--2,824 as compared to 2,155 in 1990--led to an increase in the YPLL and a corresponding increase in mortality costs. In 1990, deaths associated with drug and alcohol use resulted in 56,282 years of potential life lost. As shown in Table 4.4, this increased to 70,163 in 1996, with alcohol accounting for 51,846 years of lost life and drugs accounting for 18,318. In 1996, drugs accounted for a greater proportion (26%) of total years of life lost than in 1990 (13%). The reason for this increase in drug-related YPLL is unclear. The category representing the single greatest number of years of lost life was males 35-44 dying of alcohol-related causes. Males in this age group accounted for 7,019 (10%) years of potential life lost.

As Table 4.4 shows, premature death due to alcohol and drug use resulted in an estimated economic loss of approximately \$929 million in Washington in 1996. The corresponding economic loss in 1990 was \$586 million. On a relative basis, this \$343 million difference represents a 59% increase. Twenty percent of this increase was due to general inflation (higher wages) and 13% was due to population growth in the state (the Washington State population increased from 4.8 to 5.5 million between 1990 and 1996). The remaining proportion (26%) of the increase in mortality costs was due to a higher rate of death related to drug and alcohol use among Washington residents.

The estimated economic loss due to premature death in 1996 related to alcohol use was \$651 million, as compared to \$278 million for drug use. Alcohol-related deaths among males aged 25 to 55 accounted for the largest costs, \$357 million.

The cost estimates shown in Table 4.4 are based on two important assumptions. First, it was assumed that individuals retire before or by age 75. Second, it was assumed that an individual's productivity, hence real future income, would grow 1% annually based on his or her present income. Following Rice et al. (1990), a 4% discount rate was used in calculating the cost estimates.

## **Summary**

In 1996, 2,824 people died in Washington from drug- and alcohol-related causes, resulting in 70,000 years of potential life lost. Translated into economic terms, this loss of life represented an economic cost of approximately \$929 million. Approximately 70% of this cost represented premature death related to alcohol use and abuse. The total number of deaths, and corresponding life years lost, increased by approximately 31% between 1990 and 1996. The estimated economic loss associated with this mortality increased by \$343 million, from \$586 million to \$929 million. Some of this increase resulted from general inflation and population growth, but a considerable proportion of it was due to an increase in the incidence of death due to alcohol and drug use.

**Table 4.2**  
**Deaths Attributable to Alcohol by Diagnosis and Sex**

Diagnoses	ICD-9-CM Diagnostic Code	Alcohol Attributable Fraction	Age (Years) [1]	Total Deaths	Male		Female	
					Total Deaths	Alcohol Related Deaths	Total Deaths	Alcohol Related Deaths
Direct Causes								
Acute alcoholic hepatitis	571.1	1	≥15	24	13	13	11	11
Alcohol abuse	305.0	1	≥15	18	14	14	4	4
Alcohol dependence Syndrome	303	1	≥15	104	77	77	27	27
Alcoholic cardiomyopathy	425.5	1	≥15	28	25	25	3	3
Alcoholic cirrhosis	571.2	1	≥15	291	201	201	90	90
Alcoholic fatty liver	571.0	1	≥15	21	17	17	4	4
Alcoholic liver damage	571.3	1	≥15	73	45	45	28	28
Alcoholic psychoses	291	1	≥15	22	18	18	4	4
Fetal alcohol syndrome	760.71	1	≥0	0	0	0	0	0
Alcohol poisoning	E860.0-E860.1	1	≥15	3	3	3	0	0
Indirect Causes								
Cancer of the esophagus	150	0.75	≥35	212	153	115	59	44
Cancer of the larynx [2]	161	0.5	≥35	64	52	26	12	5
Cancer of the liver	155	0.15	≥35	204	126	19	78	12
Cancer of the oral cavity [2]	140-149	0.5	≥35	131	89	45	42	17
Cancer of the stomach	151	0.2	≥35	251	159	32	92	18
Respiratory tuberculosis	011-012	0.25	≥35	0	0	0	0	0
Diabetes mellitus	250	0.05	≥35	1204	594	30	610	31
Essential hypertension	401	0.08	≥35	84	34	3	50	4
Cerebrovascular disease	430-438	0.07	≥35	3604	1401	98	2203	154
Pneumonia and influenza	480-487	0.05	≥35	1663	736	36	951	47
Diseases of the stomach, esophagus, duodenum	530-537	0.1	≥35	191	91	9	100	10
Other cirrhosis of liver	571.5-571.6	0.5	≥35	68	33	17	35	18
Chronic pancreatitis	577.1	0.6	≥35	7	5	3	2	1

**Table 4.2 (continued)**

Diagnoses	ICD-9-CM Diagnostic Code	Alcohol Attributable Fraction	Age (Years) [1]	Total Deaths	Male		Female	
					Total Deaths	Alcohol Related Deaths	Total Deaths	Alcohol Related Deaths
Unintentional Injuries								
Accidental drownings	E910	0.38	≥0	81	67	25	14	5
Accidental falls	E880-E888	0.35	≥15	387	183	64	204	71
Accidents caused by fire	E890-E899	0.45	≥0	54	32	14	22	10
Air and transport accidents	E840-E845	0.16	≥0	32	25	4	7	1
All other accidents	E868-E869	0.25	≥15	13	10	3	3	1
All other accidents	E900-E909	0.25	≥15	30	23	6	7	2
All other accidents	E911-E929	0.25	≥15	163	122	31	41	10
Motor vehicle accidents	E810-E825	0.42	≥0	841	576	242	265	111
Other road vehicle accidents	E826-E829	0.20	≥0	4	2	0	2	0
Water transport accidents	E830-E838	0.20	≥0	34	30	6	4	1
Intentional Injuries								
Suicide	E950-E959	0.28	≥15	797	653	183	144	40
Homicide	E960-E969	0.46	≥15	241	162	85	79	36
Total				10,944	5,761	1,497	5,183	821

Notes:

[1] Deaths occurring before this age are not included in the calculations.

[2] The AAF for females is 0.40.

Sources:

1. State of Washington Health Statistic Death Tape for 1996.
2. International Classification of Diseases, 9th revision, Clinical Modification (ICD-9-CM), 3rd Edition, Practice Management Corporation.
3. Rice et al (1990).



**24Table 4.3**  
**Deaths Attributable to Drugs by Diagnosis and Sex**

Diagnoses	ICD-9-CM Diagnostic Code	Drug Attributable Fraction	Age (Years)	Total Deaths	Male		Female	
					Total Deaths	Drug Related Deaths	Total Deaths	Drug Related Deaths
Direct Causes								
Drug dependence	304	1	≥0	2	2	2	0	0
Nondependent abuse of drugs	305.1-305.9	1	≥0	71	49	49	22	22
Accidental poisoning by drugs	E850-E859	1	≥0	303	225	225	78	78
Undetermined injury from drugs	E980	1	≥0	71	50	50	21	21
Indirect Causes								
AIDS	042-044	0.05	≥0	386	355	18	31	2
Hepatitis B	070.3	0.28	≥0	28	22	6	6	2
Homicides	E960-E969	0.13	≥15	241	162	21	79	10
Total				1,102	865	371	237	135

Note: Numbers may not add due to rounding.

Sources:

1. State of Washington Health Statistic Death Tape for 1996.
2. International Classification of Diseases, 9th revision, Clinical Modification (ICD-9-CM), 3rd Edition, Practice Management Corporation.
3. Rice et al (1990).

**Table 4.4**  
**Mortality Costs and Years of Potential Life Lost (YPLL)**

Age	Alcohol		Drugs		Total	
	Costs (\$)	YPLL	Costs (\$)	YPLL	Costs (\$)	YPLL
<b>Male</b>						
1-18	34,906,569	3,511	3,638,768	366	38,545,337	3,877
19-24	74,180,500	4,799	20,635,997	1,322	94,816,497	6,121
25-34	117,064,011	6,330	68,530,400	3,625	185,594,412	9,955
35-44	138,352,542	7,019	113,737,542	5,886	252,090,084	12,905
45-54	102,233,719	6,152	28,874,787	1,779	131,108,506	7,931
55-64	39,463,881	3,947	1,806,813	196	41,270,694	4,143
65+	24,733,625	4,075	1,114,756	184	25,848,381	4,259
Total	530,934,848	35,832	238,339,063	13,358	769,273,910	49,190
<b>Female</b>						
1-18	10,589,242	2,085	560,188	103	11,149,430	2,188
19-24	8,080,496	1,105	2,389,764	319	10,470,259	1,424
25-34	18,252,984	2,181	7,855,451	947	26,108,435	3,128
35-44	29,073,458	3,303	20,709,613	2,379	49,783,071	5,682
45-54	23,263,601	2,861	6,495,319	832	29,758,920	3,692
55-64	11,311,195	1,838	794,895	149	12,106,089	1,987
65+	19,384,774	2,640	846,841	231	20,231,615	2,871
Total	119,955,749	16,014	39,652,070	4,960	159,607,819	20,973
<b>Total</b>						
1-18	45,495,811	5,596	4,198,955	469	49,694,766	6,065
19-24	82,260,996	5,904	23,025,761	1,641	105,286,757	7,545
25-34	135,316,996	8,511	76,385,851	4,572	211,702,847	13,083
35-44	167,426,000	10,322	134,447,155	8,265	301,873,155	18,587
45-54	125,497,320	9,013	35,370,106	2,611	160,867,426	11,623
55-64	50,775,076	5,785	2,601,707	345	53,376,783	6,130
65+	44,118,399	6,715	1,961,597	415	46,079,996	7,130
<b>Total</b>	<b>\$650,890,597</b>	<b>51,846</b>	<b>\$277,991,132</b>	<b>18,318</b>	<b>\$928,881,729</b>	<b>70,163</b>

## Chapter 5 Crime

Evidence accumulated over the past twenty years has shown a strong link between drug and alcohol abuse and crime. Although the exact nature of the relationship remains unclear, there is little doubt that substance abuse increases the likelihood that certain crimes will be committed. A 1989 Department of Justice study found that in some cities as many as 50% - 80% of persons arrested for felonies tested positive for drugs (Tonry & Wilson 1990). These data are consistent with data from Washington State showing that 63% and 57% of persons booked into the King and Spokane County jails, respectively, test positive for drugs (Kabel J., personal communication December 7, 1998). Recent surveys of incarcerated populations provide further evidence of the strong link between crime and substance abuse. Approximately one in four Federal inmates and one in two State inmates reported that they were under the influence of alcohol or illicit drugs at the time of their current offense (U.S. Department of Justice 1994).

This chapter analyzes crime costs for Washington in 1996. It examines four types of costs related to criminal activity: (1) Law Enforcement Costs, (2) Judicial Costs, (3) Correctional Costs, and (4) Other Societal Costs.

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### **The major findings of the analysis were:**

- Of 217 arrests for homicide, 65 were related to alcohol and 22 to drug abuse.
  - There were 6,003 arrests for felonious assaults in 1996, of which 1,801 were related to alcohol abuse and 144 related to drug abuse.
  - Total estimated drug- and alcohol-related crime costs in Washington in 1996 were \$541 million. This compares to \$348 million for 1990.
  - Of the four major crime cost categories analyzed, law enforcement costs were highest (\$202 million), followed by correctional costs (\$173 million).
-

## **Methodology**

This chapter follows the same general methodology as used for the previous 1990 cost report. Information was gathered from various sources on different criminal activities (offenses and arrests), prison populations, numbers of crime victims, and property destruction. The variables were then adjusted to reflect criminal activity related specifically to drug and alcohol abuse

The analysis was restricted to the set of crimes believed to be most closely linked to substance abuse. These crimes were analyzed in the previous 1990 cost report and in the recent national study (NIDA/NIAAA 1998) as well. They included the following Part I felonies:

- homicide
- felonious assault (aggravated assault and forcible rape)
- robbery
- burglary
- larceny (property theft)
- auto theft

Less serious Part II offenses analyzed included:

- driving while intoxicated (DWI)
- liquor law violations
- public drunkenness
- stolen property (buying, receiving and selling)
- prostitution
- drug law violations (possession, sale, use, or manufacture).

The numbers of drug- and alcohol-related crimes were estimated by multiplying crime figures by attributable fractions in the same manner as done to derive other cost estimates. The attributable fractions used were obtained from the recent national cost study sponsored by NIDA/NIAAA (1998), and represent the most

current evidence available regarding drug- and alcohol-related crime. The attributable fractions ranged from 2.8% for alcohol-related larceny crimes to 100% for DWI. In other words, it was assumed that 2.8% of all larcenies are related to alcohol use; by definition, 100% of DWI offenses are related to alcohol use.

The attributable fractions used for the analysis are shown below (crimes such as DWI with attributable fractions of 100% are not shown):

	<u>Alcohol</u>	<u>Drugs</u>
	(%)	(%)
Homicide	30.0	10.0
Felonious Assault	30.0	2.4
Robbery	3.4	27.2
Burglary	3.6	30.0
Larceny	2.8	29.6
Auto Theft	3.5	6.8
Stolen Property	0.0	15.1
Prostitution	0.0	12.8

To derive some of the cost estimates (correctional and judicial costs), it was necessary to convert numbers of arrests or offenses into dollar equivalents. This conversion was done using the same procedure as Rice et al. (1990), which assumed that costs were proportional to the numbers of crimes committed.

## **Results**

### *Law Enforcement Costs*

#### Police Protection:

Police protection costs were estimated based on the numbers of Part I and II offenses committed in 1996 (Table 5.1). The numbers of offenses were multiplied by the above attributable fractions to obtain estimates of the number of

drug- and alcohol-related offenses committed. The cost per offense was based on the cost figures used for the previous report, updated to reflect 1996 prices.

The total police protection costs for 1996 were estimated at \$139 million (Table 5.1). In contrast, police protection costs for 1990 were \$101 million. As Table 5.1 shows, there were 76 homicides and 4,942 felonious assaults in 1996 related to alcohol use or abuse. There were fewer drug-related crimes in these two categories, 25 and 395, respectively, but more drug-related robberies, burglaries and larcenies (Table 5.1).

#### Drug Control:

Drug traffic control is a national priority involving a wide range of federal, state and local agencies. Because so many different agencies are involved in drug control it is difficult to estimate accurately the costs for Washington State.

National data on drug traffic control costs were obtained for 1995 (the most recent year available) and were used to compute the per capita costs for the relevant expenditure categories shown in Table 5.2 below. These per capita costs were then used to estimate the costs for Washington State based upon the state population. Total estimated drug control expenditures for Washington State in 1996 were \$63 million

#### Judicial Costs

Legal and judicial costs were estimated based on the number of arrests for Part I and II crimes (Table 5.3). Base cost figures used for the estimation were obtained from data gathered by the U.S. Bureau of Justice Statistics. The most costly Part I crime category was larceny-theft due to the large number of drug-related arrests (11,214). The most costly Part II crime category was drug law violations. The total estimated 1996 cost for drug- and alcohol-related legal and adjudication activities was \$26.4 million, with drug abuse accounting for 83% of the costs.

**Table 5.1**  
**Police Protection Costs, Washington, 1996**  
(\$ in thousands)

Type of Offense	Number of Known Offenses (1)	Number of Alcohol and Drug Related Offenses		Alcohol Related Costs (2) (\$)	Drug Related Costs (2) (\$)	Total Costs (\$)
		Alcohol	Drug			
Part 1						
Homicide	252	76	25	113	37	150
Felonious Assault	16,475	4,942	395	7,285	582	7,867
Robbery	6,355	216	1,729	220	1,437	1,657
Burglary	56,922	2,049	17,076	3,020	20,986	24,006
Larceny	209,887	5,876	62,127	5,852	61,878	67,730
Auto Theft	28,058	982	1,851	1,447	2,728	4,175
Part II						
DWI	32,613	32,613	--	1,435	--	1,435
Liquor Laws	15,134	15,134	--	666	--	666
Public Drunkenness	197	197	--	9	--	9
Stolen Property	4,368	--	660	--	1,742	1,742
Prostitution	795	--	102	--	37	37
Drug Laws	19,220	--	19,220	--	29,868	29,868
Total	390,276	62,085	103,185	\$20,047	\$119,295	\$139,240

Sources:

- 1) *Crime in Washington State, 1996 Annual Report.*
- 2) Cost estimates were derived by taking the average cost per offense, calculated from the 1990 cost report using updated 1996 prices, and multiplying by the numbers of alcohol- and drug-related offenses.

**Table 5.2**  
**Drug Control Expenditures, Washington, 1996**  
**(\$ in millions)**

Type of Activity	Estimated Expenditures
Interdiction	23.0
Investigations	18.2
International	8.1
Intelligence	3.1
Research & Development	10.0
Regulatory & Compliance	0.6
<b>Total</b>	<b>\$63.0</b>

Source: Drugs and Crime Facts, Department of Justice, 1996.

### Correctional Costs

#### State Correctional Costs:

Total state corrections costs were estimated at \$132 million (Table 5.4), with drug-related costs accounting for \$97 million, or 74% of the total costs. Price-adjusted, annual per inmate costs were compared between the previous 1990 Washington report and the recent federal economic report (NIDA/NIAAA 1998) and showed close agreement. Since the Washington 1990 base cost estimates were viewed as being somewhat more reliable, these estimates were used. The annual per inmate costs were multiplied by the number of inmates to obtain total cost estimates shown in Table 5.4. As the table shows, the most costly offender category was drug crimes (\$73 million), followed by felonious assault (\$21 million) and homicide (\$17 million). In contrast to the \$132 million in total costs shown in Table 5.4, the corresponding 1990 cost figure was \$57 million. The difference in costs between 1990 and 1996 is due, in part, to the increase in inmates incarcerated for drug- and alcohol-related offenses. Figures 5.1 and 5.2, shown below, compare the numbers of inmates incarcerated for selected offenses for 1990 and 1996.



**Table 5.3**  
**Legal and Adjudication Costs, Washington, 1996**  
(\$ in thousands)

Type of Offense	Number of Arrests (1)	Number of Alcohol and Drug Related Arrests		Alcohol Related Costs (2) (\$)	Drug Related Costs (2) (\$)	Total Costs (2) (\$)
		Alcohol	Drug			
Part 1						
Homicide	217	65	22	51	17	68
Felonious Assault	6,003	1,801	144	1,414	113	1,527
Robbery	1,442	49	392	38	307	345
Burglary	6,187	223	1,856	175	1,457	1,632
Larceny-Theft	37,883	1061	11,214	832	8,803	9,635
Auto Theft	2,139	75	145	59	114	173
Part II						
DWI	32,360	32,360		1,294	--	1,294
Liquor Laws	14,882	14,882		595		595
Public Drunkenness	150	150		6		6
Stolen Property	4,169	--	630	--	504	504
Prostitution	1,209	--	155	--	122	122
Drug Laws	17,532	--	17,532	--	10,519	10,519
Total	124,173	50,666	32,090	\$4,464	\$21,956	\$26,420

Sources:

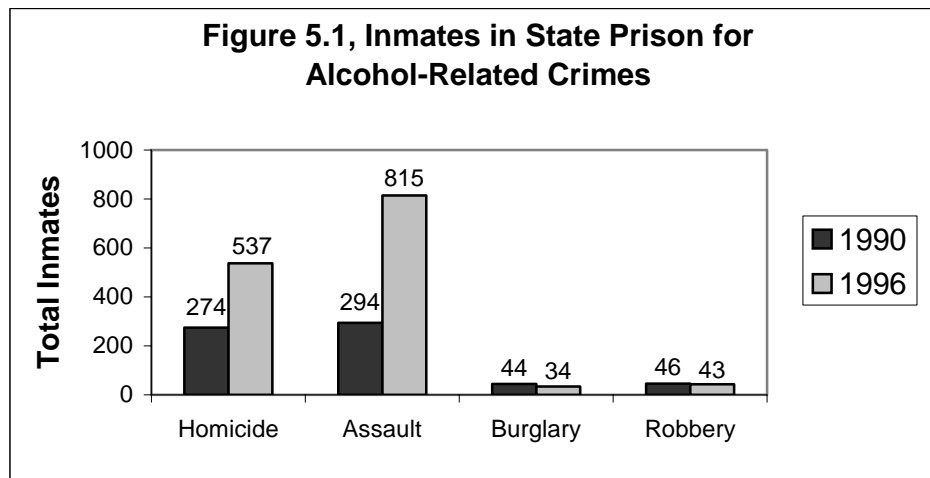
- 1) *Crime in Washington State, 1996 Annual Report.*
- 2) Justice Expenditures and Employment Extracts, 1992, U.S. Dept. of Justice, Office of Justice Programs, Bureau of Justice Statistics. Expenditure data were price adjusted to reflect 1996 prices.

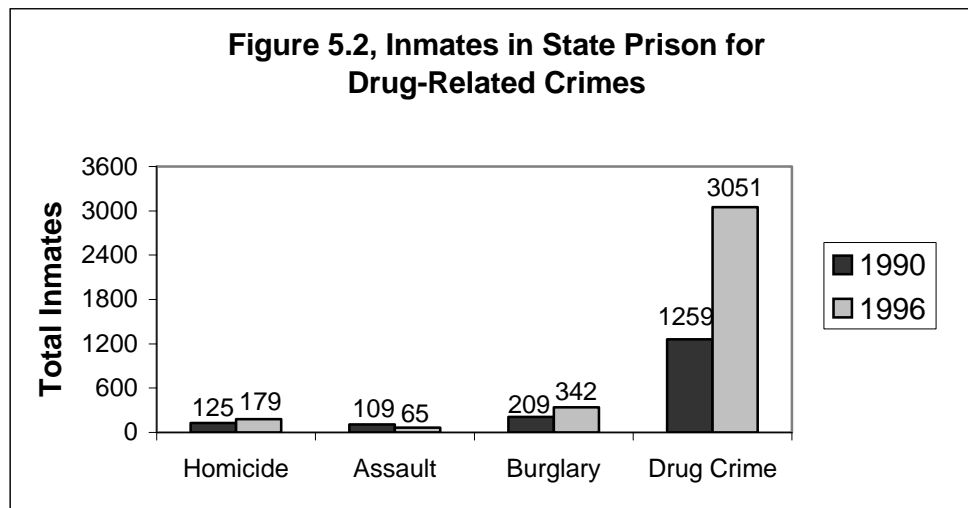
**Table 5.4**  
**State Corrections Costs, Washington, 1996**  
(\$ in thousands)

Type of Offense	Total Inmates (1)	Inmate Population		Alcohol Related Costs (2) (\$)	Drug Related Costs (2) (\$)	Total Costs (\$)
		Alcohol	Drug			
<b>Homicide</b>	1,790	537	179	12,880	4,296	17,176
Felonious Assault	2,717	815	65	19,560	1,560	21,120
Robbery	1,258	43	342	1,032	8,208	9,240
Burglary	948	34	284	816	6,816	7,632
Theft	342	19	101	456	2,424	2,880
Auto Theft	76	3	5	72	120	192
Stolen Property	170	--	26	--	624	624
Drug Crime	3,051	--	3,051	--	73,224	73,224
<b>Total</b>	<b>10,352</b>	<b>1,451</b>	<b>4,053</b>	<b>\$34,816</b>	<b>\$97,272</b>	<b>\$132,088</b>

Sources:

- 1) *Client Characteristics and Population Movement Report for Fiscal Year 1996*, State of Washington Department of Corrections Institutions and Work Training Release.
- 2) *State Justice Sourcebook of Statistics and Research*, 1996, U.S. Department of Justice, Bureau of Justice Statistics.





#### Local Corrections Costs:

Individuals arrested for alcohol- and drug-related crimes are booked into local jails. Thus, some of the expense of operating these jails should be included in the analysis as drug- and alcohol-related costs. The same general procedure for estimating state corrections costs was followed for local corrections costs. As shown in Table 5.5, total alcohol- and drug-related local corrections costs for 1996 were estimated at \$41 million, with drug-related costs accounting for \$36 million. The large proportion of drug-related costs reflects the number of prisoners booked into local jails for drug-related crimes compared to alcohol-related crimes, 3,494 versus 517, respectively.

**Table 5.5**  
**Local Corrections Costs, Washington, 1996**  
**(\$ in thousands)**

Type of Offense	Number of Local Admissions (1)	Number of Alcohol and Drug Related Admissions in Local Institutions		Alcohol Related Costs (2) (\$)	Drug Related Costs (2) (\$)	Total Costs (\$)
		Alcohol	Drug			
Homicide	41	12	4	122	41	163
Felonious Assault	782	235	19	2,397	194	2,591
Robbery	187	6	51	61	520	581
Property (Burglary, Larceny)	3,713	134	1,114	1,367	11,363	12,730
Drug Crime	2,258	--	2,258	--	23,032	23,032
Sex Crimes	482	130	48	1,326	490	1,816
<b>Total</b>	<b>7,463</b>	<b>517</b>	<b>3,494</b>	<b>\$5,273</b>	<b>\$35,640</b>	<b>\$40,913</b>

Sources:

- 1) *Jail Information Program 1996 Annual Report*, Washington Association of Sheriffs and Police Chiefs.
- 2) Total local corrections costs from *Sourcebook of Criminal Justice Statistics 1996*, Bureau of Justice Statistics.

### Other Societal Costs

Other social costs arising from drug and alcohol abuse include the costs of lost productivity due to incarceration, the value of lost productivity due to criminal victimization, and the cost of property damage arising from substance abuse-related accidents.

#### Productivity Losses Due to Incarceration:

Inmates of state prisons and local jails are unable to participate in the economy as workers. This results in a substantial economic cost to society in the form of lost productivity. The cost estimates were based upon the numbers of individuals entering state prisons and local jails and the amount of time, on average, spent during the year.

Since annual costs were calculated, the analysis was based upon a maximum of 12 months served, even though individuals served much longer for some crimes (e.g., homicide). Productivity losses were calculated based upon a \$17,000 annual wage, approximately the average wage of an individual with a high school degree. The recent NIDA/NIAAA (1998) cost report used a much higher figure (\$32,000) to calculate similar productivity losses on a national basis. The rationale for this higher figure is unclear and would seem unjustified, given the population of prisoners for whom economic loss is estimated.

The findings are presented in Table 5.6. Total productivity losses due to incarceration were estimated to be \$97.2 million, with \$84.2 million representing losses associated with incarceration in state prisons. Of the \$97.2 million, \$70.3 million were for drug-related crimes. The total economic loss due to incarceration in 1990 was \$46.4 million. Thus, in the span of six years, productivity losses due to incarceration more than doubled. The primary reason for this was the increased number of person years served in state institutions.

#### Property Destruction:

State data on property destruction costs for 1996 were unavailable. Estimates of property destruction costs were generated by taking the base (1990) cost estimates, updating them to account for inflation, and applying the 1996 number of offenses and updated drug and alcohol attributable fractions. The 1996 cost figures are presented in Table 5.7. Overall, property destruction costs due to criminal activity related to drug or alcohol abuse were estimated at \$22 million, with drug-related costs accounting for \$17.3 million. Property destruction costs increased by \$12 million from 1990 to 1996.

**Table 5.6**  
**Productivity Losses Due to Incarceration, Washington, 1996**  
**(\$ in thousands)**

Type of Offense	Drugs		Alcohol		Total Losses (\$)
	Person Years Served	Productivity Losses (\$)	Person Years Served	Productivity Losses (\$)	
State Prisons					
Homicide	179	3,043	537	9,129	12,172
Felonious Assault	65	1,105	815	13,855	14,960
Robbery	342	5,814	43	731	6,545
Burglary	284	4,828	34	578	5,405
Larceny	101	1,717	19	323	2,040
Auto Theft	5	85	--	--	85
Drug Laws	2,502	42,534	--	--	42,534
Stolen Property	26	476	--	--	476
Total	3,504	\$59,602	1,448	\$24,616	\$84,218
Local Jails					
Homicide	1.8	31	5.4	92	123
Assault	5.3	90	65.8	1,119	1,209
Robbery	15.8	269	1.9	32	301
Property (Burglary, Larceny)	189	3,213	22.8	388	3,601
Drug Crime	406	6,902	--	--	6,902
Sex Crimes	12.9	219	35.1	597	816
Total	630.8	\$10,724	131.0	\$2,228	\$12,952
Total State & Local	4,134.8	\$70,326	1,579	\$26,844	\$97,170

Notes:

- 1) Productivity is based on average annual earnings of \$17,000.

Sources:

- 1) *Client Characteristics and Population Movement Report for Fiscal Year 1996*, State of Washington Department of Corrections Institutions and Work Release Training.
- 2) Rice DP, et al (1990), *The Economic Costs of Alcohol and Drug Abuse and Mental Illness: 1985*.
- 3) *Jail Information Program 1996 Annual Report*, Washington Association of Sheriffs and Police Chiefs.

**Table 5.7**  
**Property Destruction Due to Crime, Washington, 1996**  
**(\$ in thousands)**

Type of Offense	Property Destruction Losses	Alcohol Related Losses (\$)	Drug Related Losses (\$)	Total Losses (\$)
Robbery	1,449	49.3	394.1	443.4
Assault	1,186	355.8	28.5	384.3
Larceny	10,075	282.1	2,982.2	3,264.3
Burglary	25,956	934.4	7,786.8	8,721.2
Motor Vehicle Theft	89,561	3,134.6	6,090.1	9,224.7
<b>Total Losses</b>	<b>\$128,227</b>	<b>\$4,756.2</b>	<b>\$17,281.7</b>	<b>\$22,037.9</b>

Sources:

- 1) Rice DP, et al. (1990), *The Economic Costs of Alcohol and Drug Abuse and Mental Illness*: 1985.
- 2) *Crime in Washington State, 1996 Annual Report*.

#### Criminal Victimization Costs:

The economic cost associated with criminal victimization is the value of lost productivity due to time lost from work and the cost of medical care that the victim requires. There were no state level data on the number of crime victims, so the number of Part I offenses were used for the analysis, based upon the assumption that there was one victim per offense. The average number of days lost from work was estimated in an earlier report by Liu (1992). In addition to the costs of lost work time, the costs of medical care needed by victims, as reported in the recent national study conducted by NIDA/NIAAA (1998), were incorporated in the analysis. The number of offenses were multiplied by the estimated monetary loss, based on lost work days and medical expenses, and the product was then multiplied by the appropriate attributable fraction for the offense.

The findings are shown in Table 5.8. As indicated, the total economic loss in 1996 due to criminal victimization related to drug and alcohol abuse was \$20.3 million, with drug

abuse accounting for \$15 million. The total victimization cost for 1990 was \$12.3 million. Thus, like other crime costs, the cost of victimization increased substantially between 1990 and 1996, primarily because of increased drug-related victimization costs.

**Table 5.8**  
**Productivity Losses for Victims of Crime, Washington, 1996**  
(\$ in thousands)

Type of Offense	Number of Offenses	Average Work Days Lost	Alcohol Productivity Losses (\$)	Drug Productivity Losses (\$)	Total Productivity Losses (\$)
Forcible Rape	2,759	6.2	402	32	434
Aggravated Assault	13,716	3.8	2,427	194	2,621
Robbery	6,355	4.5	866	785	1,651
Burglary	56,922	2.1	430	3,586	4,016
Larceny	209,887	1.6	940	9,940	10,880
Motor Vehicle Theft	28,058	2.5	246	476	722
<b>Total</b>	<b>317,697</b>		<b>\$5,311</b>	<b>\$15,013</b>	<b>\$20,324</b>

Notes:

- 1) Productivity was based on average annual earnings of \$100/day, except forcible rape which is based on average daily earnings for women of \$75/day.
- 2) Productivity losses include estimated costs for medical care required by the victims, as indicated in the NIDA/NIAAA (1998) national study (source #4 below).
- 3) Productivity losses were calculated based upon the attributable fractions shown at the beginning of the chapter.

Sources:

- 1) *Crime in Washington State 1996 Annual Report*, Washington Association of Sheriffs and Police Chiefs, p. 83.
- 2) Liu Ly, (1992) *Economic Costs of Alcohol and Drug Abuse in Texas-1989*.
- 3) Rice et al. (1990), *The Economic Cost of Alcohol and Drug Abuse and Mental Illness: 1985*.
- 4) The Economic Costs of Alcohol and Drug Abuse in the United States – 1992, Table C.6, NIDA/NIAAA (1998).



## **Summary**

With costs for 1996 estimated at \$541 million, criminal activity represents a major component of overall drug- and alcohol-related costs, accounting for 20% of total costs (\$2.54 billion). The category with the greatest cost was law enforcement (\$202 million), followed by corrections costs (\$173 million). The indirect costs associated with criminal activity were also significant, reaching almost \$140 million. The great majority of these costs were drug related. In 1996, over 9,000 individuals were incarcerated in state prisons or arrested and booked in local jails for crimes related to drug and alcohol abuse. The combined number of person years of prison and jail time served by these individuals was over 4,000. Crime costs in 1990 were estimated at \$348 million. Adjusting for inflation would increase the 1990 costs to approximately \$418 million. But even after adjusting for inflation, crime costs increased on a relative basis by 29% from 1990 to 1996. Much of this increase was due to the substantial increase (from \$56 million to \$132 million) in corrections (prison) costs.

## **Chapter 6**

### **Medical Care**

Alcohol or drug abuse may increase the risk of illness or injury and thereby increase the use of health care services. The effects of substance abuse on health care utilization may be obvious and immediate or more indirect and long term. The link between alcohol and drug use is clear in the case of an individual overdosing on drugs and then requiring hospitalization, or a drunk driver who sustains serious injury in an auto accident and requires emergency hospital treatment. But prolonged alcohol abuse can also increase the risk for a number of diseases, including stomach cancer, cancer of the esophagus, respiratory tuberculosis, diabetes, and hypertension, thereby increasing the demand for costly medical care as well as nursing home care.

This chapter analyzes medical costs for Washington for 1996 related to drug and alcohol abuse. Four types of medical costs are reported: hospital costs, outpatient medical costs, prescription drugs and nondurable medical supplies, and nursing home costs.

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#### **The major findings of the analysis were:**

- There were approximately 16,000 hospital discharges in Washington in 1996 directly or indirectly related to drug and alcohol use or abuse.
  - The total cost of providing hospital inpatient treatment for these patients was estimated at \$130.8 million, including \$108.7 million related to alcohol use.
  - The estimated cost of outpatient medical care was \$38.5 million.
  - Prescription drug and nondurable costs and nursing home costs were, respectively, \$29.8 million and \$11.8 million.
  - The total estimated medical cost was \$210.9 million. The corresponding 1990 cost was \$215 million.
-

## **Methodology**

The estimation of hospital inpatient costs was based upon data from the Washington Comprehensive Hospital Abstract Reporting System (CHARS). CHARS gathers information on total hospital charges, length of stay, diagnosis, sex and age for all hospital discharges in Washington. For this analysis, the CHARS records representing patients discharged within selected diagnostic categories related to drug and alcohol abuse were obtained and were used to estimate inpatient hospital costs. The adjustment process used followed the same approach as used to estimate mortality costs (see Chapter 4) and is commonly known as the illness-specific approach (NIDA/NIAAA 1998).

This illness-specific approach does not take into account the extra days a patient may stay in the hospital if he or she has a co-occurring alcohol or drug disorder. Estimating the costs of these extra days was not possible using the CHARS data obtained for this analysis, but it was possible to use cost estimates generated by the recent NIAAA/NIDA (1998) national study and extrapolate these costs to Washington. The NIDA/NIAAA study, which was based on analysis of over 200,000 records from the U.S. Hospital Discharge Survey, found that hospital inpatient costs associated with longer stays due to co-occurring alcohol or drug conditions represented 21.3% of substance abuse specific- and substance abuse related-costs. The Washington cost estimates derived from the analysis of CHARS data were increased by this same percentage (21.3%) to account for the longer hospital stays associated with secondary (co-occurring) diagnoses related to substance abuse.

Estimating drug- and alcohol-related outpatient medical costs was difficult because there is no data source for outpatient medical services equivalent to CHARS. For the earlier cost report, data on Medicaid patients were obtained from the Medical Assistance Office and used to derive statewide cost estimates. While these data reflect utilization patterns of Washington's Medicaid population, they do not represent the state's general population. For the current study, cost data from the National

Ambulatory Medical Care Survey of 1992, adjusted upward to reflect 1996 prices, were used to derive outpatient medical cost estimates. The same data were used for the recent national cost study conducted by NIDA/NIAAA. As reported in that study, the total estimated cost of outpatient medical care for the nation as a whole related to substance abuse was \$1.75 billion. This figure was extrapolated to Washington State, based upon the state's proportional population.

Cost estimates for prescription drugs and nondurable medical items and for nursing homes were also estimated based upon national data extrapolated to Washington State. As reported in the NIDA/NIAAA cost report, the estimated cost for prescription drugs and nondurable medical items used for medical treatment of diseases and injuries related to substance abuse for the nation overall in 1992 was \$1.57 billion. This figure is based upon earlier research by Harwood et al. (1984), indicating that 2.2% of expenditures in this category can reasonably be attributed to alcohol abuse (no equivalent estimates have been made for drug abuse). The \$1.57 billion figure was adjusted to reflect 1996 prices and then extrapolated to Washington State based upon the state's proportional population.

The same extrapolation procedure was used to derive cost estimates for nursing home care provided to patients whose condition was related to alcohol abuse. Based upon research from the 1985 National Nursing Home Survey, as discussed in the NIDA/NIAAA (1998) report, it was assumed that 1.0% of all nursing home expenditures could reasonably be related to alcohol abuse. The cost estimate for the nation overall was \$623 million. This cost figure was extrapolated to Washington State to derive a state estimate of nursing home costs associated with substance abuse.

## **Results**

As shown in Table 6.1, 15,829 hospital discharges occurred as a result of a medical condition or injury related to drug or alcohol abuse. Approximately 12,000 of these were related to alcohol abuse. Males accounted for 9,125 of all discharges. Of the \$107.8 million in hospital inpatient costs shown in Table 6.1, \$91.4 million (85%) were for

hospital care for an alcohol-related condition or injury. The major cost categories were: alcohol dependence, alcoholic cirrhosis, cerebrovascular disease, pneumonia, diseases of the esophagus, stomach and duodenum, acute pancreatitis, injuries, drug dependence, and poisoning by opiates.

As discussed earlier, the \$107.8 million in hospital inpatient costs shown in Table 6.1 is based on CHARS data. These costs do not include incremental expenses associated with treating patients requiring longer hospitalization resulting from co-occurring alcohol or drug dependence. The recent NIDA/NIAAA report estimated these incremental costs at 21.3% of direct alcohol- and drug-related hospital costs. To account for these other indirect costs, the estimate of \$107.8 million should be increased by 1.213. This yields a total cost estimate for alcohol- and drug-related hospital inpatient costs of \$130.8 million.

The three other medical cost categories are outpatient medical costs, prescription drug and nondurable item costs, and nursing home costs. The estimates for these three categories are shown in Table 6.2 and are based upon cost data extrapolated from the national NIDA/NIAAA (1998) cost study. As shown, the estimated cost for outpatient medical services was \$38.5 million. For prescription drug and nondurable items, the estimated cost was \$29.8 million. Finally, for nursing home care the estimated cost was \$11.8 million.

The total estimated alcohol- and drug-related medical cost for all categories combined was \$210.9 million.

**Table 6.1**  
**Drug- and Alcohol-Related Hospital Inpatient Direct Costs, Washington, 1996**  
**(\$ in thousands)**

Diagnosis or Condition	AAF (1)	Adjusted Hospital Discharges (2)		Adjusted Hospital Inpatient Costs (3)		
		Females	Males	Females (\$)	Males (\$)	Total (\$)
Alcoholic psychoses	1	356	950	1,243,430	3,879,648	5,123,078
Alcohol dependence Syndrome	1	1,013	1,841	3,425,620	6,105,100	9,530,720
Alcoholic polyneuropathy	1	1	7	3,391	31,248	34,639
Alcoholic cardiomyopathy	1	4	18	70,054	150,760	220,814
Alcoholic gastritis	1	55	117	289,421	616,781	906,202
Alcoholic fatty liver	1	1	1	1,512	1,934	3,446
Acute alcoholic hepatitis	1	90	121	1,036,073	1,065,004	2,101,077
Alcoholic cirrhosis of the Liver	1	202	383	2,626,034	6,242,353	8,868,387
Alcoholic liver damage, Unspecified	1	18	44	205,448	348,504	553,952
Toxic effects of ethyl Alcohol	1	31	43	128,597	219,161	347,758
Cancer of the lip, tongue, Oral cavity, pharynx	0.47	51	94	615,852	1,738,792	2,354,644
Cancer of the esophagus	0.75	39	89	614,156	1,947,843	2,561,999
Cancer of the stomach	0.2	24	47	424,810	841,188	1,265,998
Cancer of the liver and Intrahepatic bile ducts	0.15	8	14	94,004	226,988	320,992
Cancer of the larynx	0.49	7	36	88,556	672,781	761,337
Essential hypertension	0.08	19	12	70,481	53,222	123,703
Cerebrovascular disease	0.07	482	456	4,352,682	4,060,827	8,413,509
Respiratory tuberculosis	0.25	8	16	94,814	198,946	293,760
Diabetes mellitus	0.05	113	115	865,192	1,044,928	1,910,120
Pneumonia and influenza	0.05	398	386	2,978,107	2,948,778	5,926,885
Diseases of esophagus, Stomach, duodenum	0.1	386	392	2,881,409	3,266,391	6,147,800
Cirrhosis without mention of alcohol	0.5	63	67	661,861	1,692,195	2,354,056
Acute pancreatitis	0.41	509	477	4,799,509	5,448,944	10,248,453
Chronic pancreatitis	0.67	146	135	1,114,248	1,446,344	2,560,592
Injuries	0.38	1,137	1,187	9,096,200	9,377,300	18,473,500
Total Alcohol-related Discharges and Costs		5,161	7,048	37,781,461	53,625,960	91,407,421

Table 6.1 (continued)

Diagnosis or Condition	DAF (1)	Adjusted Hospital Discharges (2)		Adjusted Hospital Inpatient Costs (3)		
		Females	Males	Females (\$)	Males (\$)	Total (\$)
Drug psychoses	1	359	444	1,710,103	1,779,664	3,489,767
Drug dependence	1	577	778	2,308,817	2,639,780	4,948,597
Nondependent abuse of drugs	1	58	70	195,318	205,527	400,845
Narcotics affecting fetus or newborn via placenta or breast	1	1	0	7,515	0	7,515
Drug withdrawal syndrome in newborn	1	1	0	4,577	0	4,577
Poisoning by opiates and related narcotics	1	489	259	2,393,876	1,788,199	4,182,075
Poisoning by sedatives and hypnotics	1	58	39	281,681	309,868	591,549
Poisoning by central nervous system muscle tone depressants	1	0	39	0	258,734	258,734
Poisoning by psychotropic agents	1	0	430	0	2,344,107	2,344,107
Poisoning by central Nervous system Stimulants	1	0	18	0	134,807	134,807
Total Drug-related Discharges and Costs		1,543	2,077	6,901,887	9,460,686	16,362,573
<b>Total Drug and Alcohol-related Discharges and Costs</b>		<b>6,704</b>	<b>9,125</b>	<b>\$44,683,348</b>	<b>\$63,086,649</b>	<b>\$107,796,997</b>

## Notes:

- (1) AAF and DAF refer to alcohol and drug attributable fractions, respectively.
- (2) Adjusted hospital discharges are the total number of discharges multiplied by the corresponding attributable fraction.
- (3) Adjusted hospital costs are the total costs multiplied by the corresponding attributable fraction.

Source: Washington Comprehensive Hospital Abstract Reporting System (CHARS), 1996 data file.

**Table 6.2**  
**Other Medical Costs**

Cost Category	Total Costs (\$ thousands)
Outpatient Medical Services	38,500
Prescription Drugs and NonDurable Items	29,800
Nursing Home Care	11,800
<b>Total</b>	<b>\$80,100</b>

### Summary

Total medical costs associated with drug and alcohol abuse for Washington in 1996 were estimated at \$210.9 million, with \$130.8 million representing inpatient hospital care. Over 90% of the total costs were related to medical problems and injuries resulting from alcohol use and abuse. Outpatient medical services accounted for \$38.5 million, while prescription drugs and nondurable items accounted for \$29.8 million.

The total cost estimates for 1996 (\$210.9 million) were similar to the earlier 1990 cost estimates (\$215.8 million), but the 1996 cost estimates are more conservative and probably more reasonable. Because different data sources were used for the two analyses, strict comparisons of cost estimates are not appropriate, except for inpatient hospital costs based on the CHARS data. Excluding injuries, which were not estimated from CHARS for the 1990 cost study, the estimated hospital inpatient costs related to drug and alcohol abuse for 1990 and 1996 were \$57.3 million and \$89.3 million, respectively. In relative terms, hospital inpatient costs increased by 56%. This increase tracked closely the relative increase in hospital discharges between 1990 and 1996 related to substance abuse. In 1990, there were an estimated 10,479 hospital discharges with a primary diagnosis related to substance abuse. This increased by 55% to 15,829 in 1996.



## **Chapter 7**

### **Specific Diseases**

In this chapter, the costs associated with three specific diseases—acquired immune deficiency (AIDS), hepatitis B (HBV) and fetal alcohol syndrome (FAS)—are presented. Unlike many other alcohol- and drug-related diseases and illnesses analyzed in Chapter 6, these three diseases result in long-term medical and social costs. For example, an AIDS patient is about 60% less productive at work due to the illness, and he or she requires frequent medical attention (Scitovsky and Rice, 1987). Because of the special nature of AIDS, HBV, and FAS and because of their close association with drug and alcohol abuse, the cost estimates for these diseases are presented separately in this chapter. The chapter follows the same general methodology as used for the previous economic cost report (Wickizer et al 1993). Interested readers can obtain more detailed information on the methods used to derive the cost estimates from Appendix D of the earlier report.

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#### **The major findings of the analysis were:**

- Total costs for AIDS and hepatitis B associated with injection drug use and for FAS were estimated at approximately \$80.7 million.
  - Of these costs, AIDS accounted for \$66.1 million, hepatitis B for \$5.2 million, and FAS for \$9.4 million.
  - AIDS contracted through injection drug use accounted for 50 deaths, hepatitis B for 8 deaths, and FAS for 1 death.
- 

AIDS and HBV are blood-borne communicable diseases that can be transmitted to anyone who comes in contact with the viruses. AIDS and HBV are readily spread among injection drug users who share needles. Injection drug users can then transmit these diseases to non-drug users through sexual activities. The cost estimates presented in this chapter represent the costs of AIDS and HBV associated with injection drug use.

FAS is a perinatal condition that is caused by maternal use of alcohol during pregnancy. FAS is uncommon, with a rate of about 1.0 to 1.3 per 1,000 live births for the general obstetric population (Hansen et al. 1978; Abel 1995), yet it impairs the infant with learning disabilities (Streissguth et al. 1994; Streissguth, Barr and Sampson 1990) and physiological impairments for the rest of his or her life (Streissguth et al. 1991). FAS-afflicted adolescents and young people are often physically violent, more likely to become alcohol abusers later in life, and require frequent medical attention.

Previous chapters have presented separate sections describing the methodology used to derive the cost estimates. Because the cost estimation methodology differs markedly among the three diseases, the methods are described separately as part of results sections.

## **Results**

### *AIDS and HIV Associated with Injection Drug Use*

The link between AIDS and drug use is well documented. On a national basis, as many as 25% of AIDS cases result from injection drug use, while an additional 6% result from injection drug use and male-male sex (Centers for Disease Control, 1997). In Washington State, these percentages are lower, approximately 8% and 10%, respectively (Washington State Health Department, 1998). In addition to this direct relationship between drugs and AIDS, drug or alcohol abuse often is a contributing factor in that it impairs judgment leading to unsafe sexual practices.

While it does not require the frequent or intense medical treatment of AIDS, HIV disease demands significant outpatient care, counseling and diagnostic testing. The first three stages of HIV disease are not reportable conditions in Washington State. Thus only estimates for the number of HIV seropositive cases exist.

During 1996, there were an estimated 3,400 living persons with AIDS in Washington State, and 488 new cases of AIDS were diagnosed during 1996 (Washington State Health Department, 1998). Of these 3,400 cases, 8%, or 272, contracted the disease

directly through injection drug use. In addition, another 10%, or 340, contracted it either from injection drug use or male-male sex. There is no way to determine accurately how many of these additional 340 cases contracted the disease from injection drug use and not male-male sex. For purposes of this analysis, it was assumed that half (170) contracted it through injection drug use. Based on this assumption, the total number of living persons whose AIDS was contracted through injection drug use would be 442 (272 + 170).

In addition to the 442 AIDS cases, data gathered by the state Health Department indicate there were approximately 1,825 persons infected with HIV as a result of injection drug use. This figure includes 1,250 heterosexual injection drug users, and 575 homosexual male injection drug users. (The 575 figure was derived based on the same assumption as discussed above for AIDS, namely, that 50% of the individuals who are injection drug users engaging in male-male sex contracted HIV from drug use.)

Research conducted by Hellinger (1991) suggests the annual medical cost of treating AIDS and HIV cases in 1996 in Washington State would be approximately, \$36,000 and \$5,900, respectively, in 1996 dollars. Multiplying these costs by the number of injection drug users with AIDS and HIV yields estimates of approximately \$15,912,000 and \$10,767,500, respectively.

Non-personal medical costs (i.e., testing/counseling, patient care/support services, administration) were also estimated (Intergovernmental AIDS Report, 1991). The non-personal medical costs incurred in 1996 for caring and supporting injection drug user AIDS patients were \$1,681,000, with males accounting for three-quarters of this expense.

Indirect costs of injection drug use-related AIDS and HIV include mortality (premature death) and morbidity (lost productivity). Mortality figures for injection drug use-related AIDS were based on 1996 vital statistics data gathered by the Washington State Health Department. A total of 386 persons died as a result of AIDS. Using the 13% figure

noted above as the fraction of AIDS cases resulting from injection drug use yields an estimated number of drug-related deaths of 50. Following the same methodology as outlined in Chapter 4, the economic loss associated with these (50) premature deaths was estimated to be \$29,500,000. (These costs are included in the overall mortality cost estimates presented in Chapter 4.)

Morbidity costs of AIDS and HIV disease, representing reduced productivity as measured by earnings, were estimated to be approximately \$8,200,000, based on the methodology described in Chapter 3. Table 7.1 presents the cost estimates for HIV and AIDS.

**Table 7.1**  
**Cost of Acquired Immune Deficiency Syndrome (AIDS)**  
**Associated with Injected Drug Use**  
**Washington, 1996**  
**(\$ in thousands)**

Type of Cost		Male (\$)	Female (\$)	Total (\$)
Direct	Medical	19,402	7,278	26,680
	Nonpersonal	1,261	420	1,681
Indirect	Mortality*	24,485	5,015	29,500
	Morbidity	6,396	1,804	8,200
<b>Total</b>		<b>\$51,544</b>	<b>\$14,517</b>	<b>\$66,061</b>

\* Mortality estimate is based on a 4% discount rate. See Chapter 4 for formula.

Sources:

- 1) Medical—Washington State Health Department 1998 and Hellinger (1991). Data are price adjusted to reflect 1996 prices.
- 2) Nonpersonal--Intergovernmental AIDS Report (1992), based on costs from Testing/Counseling, Patient Care/Support Services, and Administration.

### *Hepatitis B*

Hepatitis B (HBV) is an infectious disease that is most often transmitted by injection drug use, heterosexual contact with an infected person or multiple partners, and homosexual activity. On a national basis, approximately 28% of all HBV cases are

related to injection drug use (Morbidity & Mortality Weekly Report, 1990). Some additional cases result from transmission of HBV from injection drug users to non-injection drug users through sexual activity, but reliable estimates of how frequently this occurs do not exist, so cost estimates related to this form of transmission are not presented.

The prevalence of HBV in Washington State peaked in 1989 at approximately 25 per 100,000. Since that time the prevalence has dropped steadily, reflecting broader national trends. In 1996, there were 255 reported cases of HBV in Washington State. The underlying prevalence of HBV is higher, but many persons remain symptom-free for long periods of time. Assuming that 28% of the 255 cases resulted from injection drug use, the number of attributable cases would be 71, with males accounting for 60%, or 43 of these cases. The total medical cost for treating these cases (inpatient and outpatient care) was estimated to be \$99,161 (see Table 7.2).

Indirect costs associated with injection drug-use related HBV include mortality (premature death) and morbidity costs (lost productivity). Twenty-eight persons died of HBV in Washington in 1996. Using the 28% attributable fraction yields an estimate of 8 drug-related deaths, 6 males and 2 females. Based upon the methodology used in Chapter 4, these 8 deaths would result in an economic loss of approximately \$3,032,000. Morbidity costs, based upon the methodology described in Chapter 3 and upon an impairment rate of .37 (see earlier cost report [Wickizer et al. 1993], Appendix D), were estimated at \$2,075,000 (see Table 7.2).

**Table 7.2**  
**Cost of Hepatitis B (HBV) Associated with Injected Drug Use,**  
**Washington, 1996**  
**(\$ in thousands)**

Type of Costs	Male (\$)	Female (\$)	Total (\$)
Direct	56	43	99
Indirect			
Mortality*	2,426	606	3,032
Morbidity	1,224	851	2,075
<b>Total</b>	<b>\$3,706</b>	<b>\$1,500</b>	<b>\$5,206</b>

Note:\* Mortality cost estimates are based on 4% discount rate. See Chapter 4 for formula.

### *Fetal Alcohol Syndrome*

Fetal alcohol syndrome (FAS) results from exposure of a fetus to alcohol over the course of a woman's pregnancy. Damage to the fetus can be physical, mental, or both. The diagnosis of FAS is often based on three criteria (Abel and Sokol, 1987): (1) pre and/or post natal growth retardation, or weight, length, and/or head circumference below the tenth percentile; (2) central nervous system problems, including neurological abnormality or intellectual impairment; and (3) characteristic facial features, including small eyes, crossed eyes, or abnormalities of the mouth such as cleft palate. Other problems associated with FAS include heart defects, hearing loss, visual defects, dental defects, and mental retardation.

Determining the number of persons living with FAS is difficult. Many babies with FAS do not exhibit characteristic behaviors and growth abnormalities until age two or three, making diagnosis and surveillance more complicated. The earlier cost report (Wickizer et al. 1993) used an incidence rate of 1.3 per 1,000. In other words, it was assumed that for every 1,000 live births in Washington State in 1990, 1.3 births involved FAS. Recent research suggests that estimate was reasonable. Abel (1995) updated incidence rates for the U.S. overall and found that among the general obstetric

population the incidence of FAS is 0.97 per 1,000 live births, but this rate increases greatly (to 43 per 1,000) among women who are heavy drinkers. The general incidence in the U.S. is now believed to be approximately 1.95 per 1,000 live births. But the FAS rate is higher among lower SES groups.

Based on Washington State's demographic profile, using an incidence rate of 1.3 per 1,000 live births still seems reasonable. There were 77,874 live births in 1996 in Washington State. Using the specified FAS incidence rate of 1.3 per 1,000 implies there were 101 FAS infants born in Washington State in 1996.

The most widely reported cost associated with FAS is for intensive neonatal care for newborns. It is estimated that 75% of all FAS babies are low birthweight. Applying this figure to the number of FAS infants (101) suggests that as many as 75 FAS infants may have needed neonatal intensive care during 1996. Based on historic hospital charges, the total cost for these infants would be approximately \$4,668,000. The exact number of infants requiring rehospitalization during their first year is unknown. Applying the same rehospitalization rate as used for the earlier cost report (Wickizer et al. 1993) suggests that the cost of rehospitalization in 1996 would be approximately \$173,000.

In addition to these costs at birth, there are other medical costs incurred by FAS children and adults. These costs are related to surgical procedures needed to correct problems resulting from FAS, e.g., cleft palate surgery, as well as special services needed to monitor development, e.g., audio screening. The annual estimated 1996 cost for these medical and surgical services was \$1,510,000, based on the FAS population. Finally, some FAS children and adults who have serious mental problems or developmental disabilities may need special services, ranging from special educational services to prolonged institutional care. The estimated cost of providing residential care for FAS individuals in 1996 was \$2,520,000.

**Table 7.3**  
**Cost of Fetal Alcohol Syndrome (FAS), Washington, 1996**  
**(\$ in thousands)**

Complications	Costs (\$)
Medical*	1,510
First year rehospitalization	173
Mental retardation	2,520
Neonatal care	4,668
Neonatal physician care	518
<b>Total</b>	<b>\$9,389</b>

\*Medical includes initial audio screening, audio check-up, otitis media surgery, hearing aid, hearing aid mold, heart surgery, cleft palate surgery (see Weeks, M. 1989).

## Summary

This chapter has summarized the costs associated with three specific diseases that are closely linked to drug or alcohol abuse, AIDS, hepatitis B, and fetal alcohol syndrome. The total estimated costs of these diseases were, respectively, \$66,601,000, \$5,206,000 and \$9,389,000. Injection drug use is a major risk factor for both AIDS and hepatitis B. Drug use not only threatens the lives of drug users, but also places others at risk for serious illness or possible premature death when injection drug users engage in unsafe sexual practices. FAS, the third disease analyzed, also poses a serious health risk for infants born to women who drink heavily during pregnancy.



## Chapter 8

### Other Related Costs

In addition to the costs examined in the previous chapters, there are three other drug- and alcohol-related costs that are included in this analysis. These are the costs of social welfare administration, fire destruction and non-medical costs of motor vehicle accidents. The general methodology used to estimate these costs was similar to that used to estimate other costs. Attributable risk coefficients, used by Rice et al. (1990) and NIDA/NIAAA (1998), were applied to cost data obtained from secondary data sources and used to generate estimates of costs related to drug and alcohol abuse.

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#### **The major findings of the analysis were:**

- An estimated \$8.9 million was spent on social welfare administration in Washington State during 1996 related to drug and alcohol abuse.
  - Alcohol is believed to play a role in a large proportion of fires started as a result of smoking. In 1996, the estimated cost of these fires was \$7.9 million.
  - There were 263 alcohol-related fatal motor vehicle accidents and 5,425 non-fatal injury accidents during 1996. The total nonmedical cost of alcohol-related motor vehicle accidents was \$237.1 million.
  - The combined cost of all three cost categories was \$253.9 million.
- 

Since the methods used to derive the cost estimates vary among the three areas, the methodological description is provided as part of the results sections.

## **Results**

### *Social Welfare Administration*

Social welfare programs serve individuals with substance abuse problems. Therefore, it is appropriate to include a portion of these expenses as part of the overall costs of substance abuse. Direct welfare payments to clients, however, are considered transfer (redistribution) payments, and thus are not included.

Drug- and alcohol-related administrative costs for social welfare programs are shown in Table 8.1. The first program category shown is OASDI and SSI, two federal programs representing Old Age, Survivors and Disability Insurance (OASDI) and Supplemental Security Income (SSI). The next program category represents Aid to Families with Dependent Children (AFDC) and the food stamp program. Table 8.1 includes two additional program categories, representing alcohol and drug treatment/prevention program administration within the welfare system and veterans pensions and rehabilitation.

As shown in Table 8.1, only a small percentage of the total administrative costs is considered alcohol or drug related (except for drug and alcohol program administration), based on the recent national economic study sponsored by NIDA/NIAAA (1998). The total estimated cost for all programs combined is approximately \$9 million.

**Table 8.1**  
**Administrative Costs of Social Welfare Programs,**  
**Washington, 1996 (\$ in thousands)**

<b>Program</b>	<b>Total Admin. Costs (\$)</b>	<b>% Due to Alcohol or Drug Abuse [3]</b>	<b>Alcohol and Drug Admin. Costs (\$)</b>
OASDI & SSI [1]	79,000	1.7	1,343
Public Assistance: AFDC & Food Stamps[1]	126,000	4.1	5,166
Alcohol / Drug Abuse [2]	115	100	115
Veterans Pensions & Rehabilitation [2]	20,100	11.3	2,271
<b>Total</b>	<b>\$225,215</b>		<b>\$8,895</b>

Sources and Notes:

- 1) National data extrapolated from The Economic Costs of Alcohol and Drug Abuse in the United States (Table 6.10), NIDA/NIAA, U.S. Government Printing Office, Washington, DC, 1998.
- 2) Updated data from 1990 Washington State Economic Report, Olympia, WA 1993.
- 3) Attributable %'s from Source #1.

## *Fire Destruction*

Alcohol plays a role in economic losses resulting from fire destruction. While the extent of this role is unclear, the best available information from an early study (Berry & Boland 1977) suggests that approximately 6.1% of all fire destruction can be linked to alcohol. The earlier cost report (Wickizer et al. 1993) indicated the annual alcohol-related, fire destruction costs in Washington State were \$14 million. Extrapolation from more recent national data implies the cost figure would be closer to \$8 million. The 1996 cost estimates were derived by combining the base 1990 figure from the earlier cost report (Wickizer et al. 1993) with more recent extrapolated national data, and then updating the costs to reflect 1996 prices. The new estimates are shown in Table 8.2. The total estimated cost of fire destruction related to alcohol abuse is \$7.9 million.

**Table 8.2**  
**Cost of Property Damage and Destruction Due to Fire**  
**Washington 1996 (\$ in thousands)**

<b>Type of Insurance</b>	<b>Total Losses Due to Fire (\$)</b>	<b>Total Alcohol-Related Losses (\$)</b>
Fire Alone	18,152	1,107
Home Owners	66,389	4,049
Farm Owners	4,980	304
Commercial / Multiple Peril	39,654	2,419
<b>Total</b>	<b>\$129,175</b>	<b>\$7,879</b>

### *Motor Vehicle Accidents*

Use or abuse of drugs and alcohol is a significant risk factor for motor vehicle accidents. Costs resulting from alcohol- or drug-related accidents result from premature death, medical care, vehicle damage, and legal and court costs. The costs related to premature death were presented in Chapter 4, and those related to medical care were reported in Chapter 6. This section reports on other motor vehicle accident costs, including legal and court costs, insurance administration, and vehicle damage. The source of the cost information is a recent comprehensive study by Blincoe and Faigin (1992). Data on the number of accidents comes from the National Highway Transportation Safety Administration.

While drug abuse is known to contribute to some accidents, there is no published, reliable research on the frequency of drug-related accidents that do not involve alcohol. Because of this lack of data, the recent NIDA/NIAAA (1998) national cost study limited the cost estimates to alcohol-related crashes only. The same approach is followed here.

Based on available data maintained by the National Highway Traffic Safety Administration and on the research of Blincoe and Faigin (1992), Table 8.3 shows the number of alcohol-related accidents by type of accident and the estimated cost per accident for Washington State in 1996.

**Table 8.3**  
**Number of Alcohol-Related Accidents and Cost by Type**  
**of Accident, Washington, 1996**

	Fatal Accidents	Non-Fatal Injury Accidents	Property Damage Only Accidents
Number of alcohol- related accidents	263	5,425	12,591
Legal/Court	\$72,141	\$7,835	\$112
Insurance Administration	\$34,008	\$9,472	\$103
Vehicle Damage	\$11,386	\$8,751	\$2,798

Based on the above information, estimates were derived representing the nonmedical costs associated with motor vehicle accidents (see Table 8.4). The total costs were estimated at \$237.2 million. The most costly accident category was non-fatal injury accidents, which accounted for 59% of total costs, followed by fatal accidents. The estimated cost of motor vehicle accidents for 1996 was 2.4 times higher than the estimated cost for 1990 (\$97 million). The primary reason for this difference was that the 1996 cost estimates were based on more recent and reliable accident cost data.

**Table 8.4**  
**Nonmedical Costs Associated with Motor Vehicle Accidents**  
**Washington, 1996 (\$ in thousands)**

	Fatal Accidents (\$)	Non-Fatal Injury Accidents (\$)	Property Damage Only Accidents (\$)	Total Costs (\$)
<b>Legal/Court</b>	18,973	42,505	1,410	62,888
Insurance Administration	8,944	51,386	1,297	61,627
Vehicle Damage	29,945	47,474	35,230	112,649
<b>Total Costs</b>	<b>\$57,862</b>	<b>\$141,365</b>	<b>\$37,937</b>	<b>\$237,164</b>

Note: Numbers may not add up due to rounding.

## **Summary**

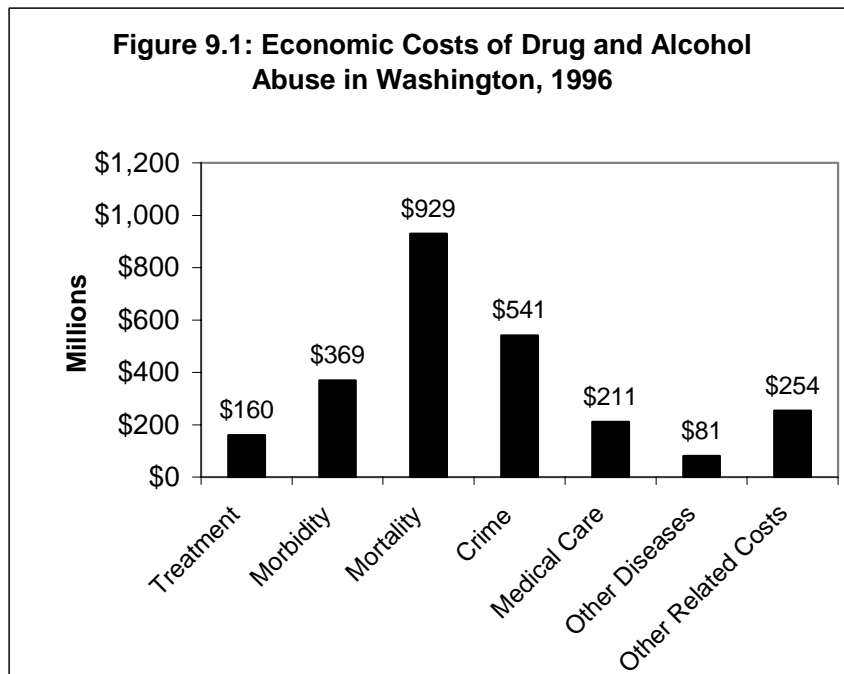
This chapter presented estimates for selected costs not included in previous chapters. Of the three cost categories examined, social welfare administration, fire destruction, and nonmedical motor vehicle accident costs, the third category was the most prominent, accounting for over 95% of the total cost (\$253.9 million). There were 263 fatal crashes involving alcohol in Washington State in 1996 and approximately 18,000 other crashes. This analysis highlights the significant economic loss associated with alcohol use and abuse resulting from motor vehicle accidents.

## CHAPTER 9

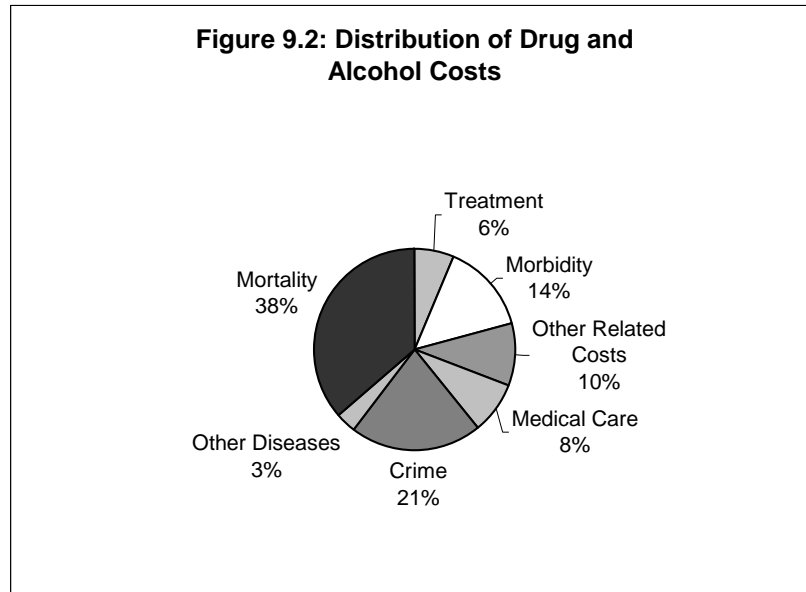
### SUMMARY AND IMPLICATIONS

#### Summary of Findings

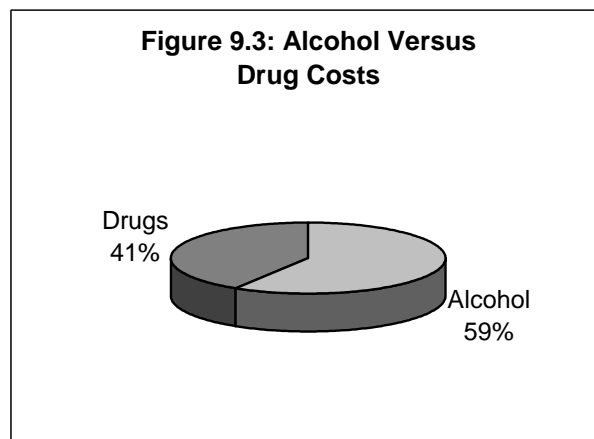
The total economic cost of drug and alcohol abuse in Washington in 1996 was estimated at \$2.54 billion. Figure 9.1 summarizes these costs among the seven areas analyzed in the previous chapters. As shown, the largest single cost category was mortality, which accounted for \$929 million. The next largest cost category was crime (\$541 million), followed by morbidity (\$369 million), other related costs (\$254 million) and medical care (\$211 million). The \$2.54 billion translates in a (per capita) cost of \$531 for every non-institutionalized person in Washington State.



The percentage distribution of costs is shown in Figure 9.2. As shown, mortality accounted for 38% of total costs, followed by crime (21%) and morbidity (14%).

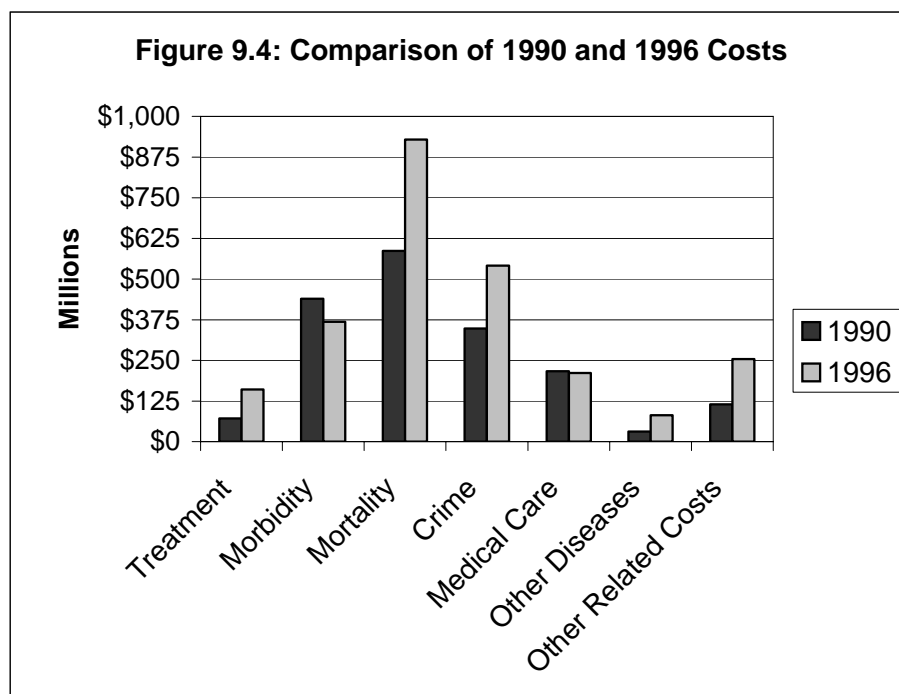


As shown in Figure 9.3, in 1996 alcohol abuse accounted for 59% of total costs, drug abuse accounted for the remaining 41%. The corresponding percentage figures for 1990 presented in the earlier cost report (Wickizer et al. 1993) were 63% and 37%, respectively.





The costs of drug and alcohol abuse increased markedly between 1990 and 1996, as shown in Figure 9.4. The cost categories with the largest absolute expenditure increases were mortality (\$343 million), crime (\$193 million) and other related costs (\$140 million). The decrease in morbidity costs, as discussed in Chapter 3, was largely due to lower drug and alcohol abuse prevalence estimates used for this report. Even though there were substantially more drug- and alcohol-related hospital discharges in 1996 than 1990 (16,000 versus 10,500), Figure 9.4 shows little difference in total medical costs. As discussed in Chapter 6, a more conservative approach was used to estimate medical costs for 1996, which reduced the costs for hospitalized patients who have a co-occurring (secondary) diagnosis of alcohol or drug abuse. The increase in total costs shown in Figure 9.4 translates into a corresponding increase in per capita costs. In 1990, \$382 was spent for every non-institutionalized person in the state. This cost figure increased to \$531 in 1996.



The goal of this report was to document the economic costs associated with drug and alcohol abuse. But readers should keep in mind that drug and alcohol abuse also has serious--often tragic--consequences that affect families and individuals in ways that cannot be quantified through economic analysis. In 1996, it was estimated that 2,824 persons died of causes related to drug or alcohol abuse. These deaths resulted in a loss of approximately 70,000 years of potential life. The problem of drunk driving affects thousands of persons. In 1996, there were 263 fatalities in Washington involving alcohol-related automobile accidents and almost 7,000 injuries. Approximately 3% to 5% of these injuries could be classified as severe or critical, and some may have led to lifelong disability.

How do the costs reported here for Washington State compare with those reported elsewhere? Strict comparisons are difficult to make among different studies because of differences in methods, definitions, and data. However, a limited review of the major findings of the two national studies (Rice et al. 1990; NIDA/NIAAA 1998), which provide national cost estimates for 1985 and 1992, and updated estimates for 1995, is instructive. In 1985, national cost estimates for drug and alcohol abuse were \$44.1 billion and \$70.3 billion, respectively. By 1992, these costs had increased to \$98 billion and \$148 billion. These absolute dollar increases translate into relative increases of 50% for drugs and 42% for alcohol after adjusting for inflation and population growth. The researchers performing the 1992 national study, provided a set of cost estimates for 1995, based on population growth and inflation but assuming no change in the prevalence of drug or alcohol abuse. The 1995 estimates for drug and alcohol abuse were \$109.8 billion and \$166.5 billion, respectively.

Two types of comparisons between Washington's cost estimates and these national estimates can be made: (1) comparison of changes in costs over time, and (2) comparison of the level of costs at a point in time. In the six-year period spanning the two Washington studies (1990 – 1996), drug costs increased from

\$0.67 billion to \$1.03 billion, while alcohol costs increased from \$1.14 billion to \$1.47 billion. On a relative basis, these increases were 53% and 30%, respectively. Based upon inflation and population growth alone, one would have expected to observe an increase of roughly 33% (20% for inflation and 13% for population growth). Thus, the net increase for drugs would be 20% (53% - 33%). For alcohol there was actually no increase after adjusting for inflation and population growth.

Although the time periods spanned by the Washington State studies (1990 to 1996) and the national studies differ, this comparison suggests that alcohol- and drug-related costs in Washington State have been increasing at a *slower rate* than for the nation as a whole. But readers are cautioned about drawing firm conclusions from this comparison because of differences in methodology and data sources used for the Washington State and national studies.

These ambiguities notwithstanding, it is useful to compare cross-sectional costs for Washington State and the national as a whole. In 1995, national estimates for drug and alcohol abuse were \$109.8 billion and \$166.5 billion, respectively. Washington State represents 1.91% of the nation's overall population. If Washington's costs were representative, one would expect them to equal roughly 1.91% of the nation's costs overall. Applying the 1.91% population percentage to the national cost estimates for 1995 yields figures of \$2.1 billion for drugs and \$3.2 billion for alcohol, for a combined total of \$5.3 billion. The combined drug and alcohol cost estimate generated by this analysis was \$2.54 billion, approximately *half* the cost one would expect based upon Washington State's share of the nation's population.

Although caution should be used in drawing conclusions from the above comparisons, it appears that Washington State has experienced favorable trends in the economic costs of drug and alcohol abuse costs as compared to the nation as a whole. Whether, or the extent to which, these economic outcomes are a

result of Washington State's treatment and prevention efforts is unclear. It is plausible that at least some of the difference in observed versus expected substance abuse costs results from Washington State's treatment and prevention efforts.

## **Implications**

This report closes with a brief discussion of implications that follow from the findings. Between 1990 and 1996, the cost of drug abuse grew more rapidly than the cost of alcohol abuse. The primary reason for this was the increase in incarceration of drug offenders. While debate continues about the wisdom of incarcerating nonviolent individuals for drug offenses as opposed to expanding access to treatment under controlled circumstances, it is clear that incarceration is costly. More research is needed about the long-term deterrent effects of incarceration versus a greater reliance on treatment. Recent research on the use of drug courts as an alternative to the traditional adjudication process and incarceration has generated promising findings (Belenko 1998).

One question raised by the cost estimates presented in this report is the following: Are we putting enough resources into preventing and treating the serious problem of drug and alcohol abuse? Washington State does devote significant resources to prevention and treatment, yet, as this report indicates, these resources are very limited in comparison to the economic burden imposed by substance abuse. As noted earlier, only 21% of those needing publicly funded treatment who qualify based on income criteria actually receive treatment (Kabel et al. 1996).

The results of this study can also be placed in context by considering the amount of revenue collected by the state through specially designated alcohol taxes in relation to the total economic loss resulting from alcohol abuse. In fiscal year 1996, approximately \$136 million was gathered through state alcohol taxes levied on beer, wine and spirits. For every \$1 the state collected in tax revenue from alcohol sales in 1996, \$12 was spent as a result of alcohol abuse.

The economic costs of substance abuse in Washington State are increasing, but at a slower rate than for the nation as a whole. Yet the large magnitude of these costs--\$2.5 billion in 1996 and the gap between treatment need and access (only 21% of those in need of publicly funded treatment actually receive treatment)--suggests a continued necessity to consider whether current resources for treatment and prevention are adequate.

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